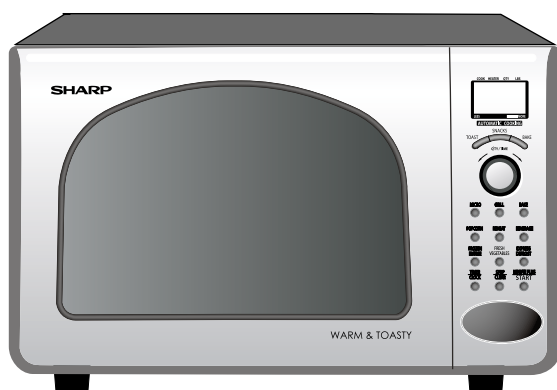


SHARP SERVICE MANUAL

SY517R55TSPF/



TOASTER OVEN WITH MICROWAVE

MODEL **R-55TS-F**

In the interest of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

WARNING TO SERVICE PERSONNEL: Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts may result in a severe, possibly fatal, electrical shock. (High Voltage Capacitor, High Voltage Power Transformer, Magnetron, High Voltage Rectifier Assembly, High Voltage Harness etc..)

TABLE OF CONTENTS

	Page
PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO	
AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY	INSIDE FRONT COVER
BEFORE SERVICING	INSIDE FRONT COVER
WARNING TO SERVICE PERSONNEL	1
MICROWAVE MEASUREMENT PROCEDURE	2
FOREWORD AND WARNING	3
PRODUCT SPECIFICATIONS	4
GENERAL INFORMATION	4
OPERATION	6
TROUBLESHOOTING GUIDE	11
TEST PROCEDURE	13
TOUCH CONTROL PANEL	21
COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE	27
PICTORIAL DIAGRAM	34
CONTROL UNIT CIRCUIT	35
PRINTED WIRING BOARD	36
PARTS LIST	37
PACKING AND ACCESSORIES	41

SHARP CORPORATION

This document has been published to be used for after sales service only.

The contents are subject to change without notice.

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

- (a) Do not operate or allow the oven to be operated with the door open.
- (b) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary: (1) interlock operation, (2) proper door closing, (3) seal and sealing surfaces (arcing, wear, and other damage), (4) damage to or loosening of hinges and latches, (5) evidence of dropping or abuse.
- (c) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.
- (d) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.
- (e) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

BEFORE SERVICING

Before servicing an operative unit, perform a microwave emission check as per the Microwave Measurement Procedure outlined in this service manual.

If microwave emissions level is in excess of the specified limit, contact SHARP ELECTRONICS CORPORATION immediately @ 1-800-237-4277.

If the unit operates with the door open, service person should 1) tell the user not to operate the oven and 2) contact SHARP ELECTRONICS CORPORATION and Food and Drug Administration's Center for Devices and Radiological Health immediately.

Service personnel should inform SHARP ELECTRONICS CORPORATION of any certified unit found with emissions in excess of $4\text{mW}/\text{cm}^2$. The owner of the unit should be instructed not to use the unit until the oven has been brought into compliance.

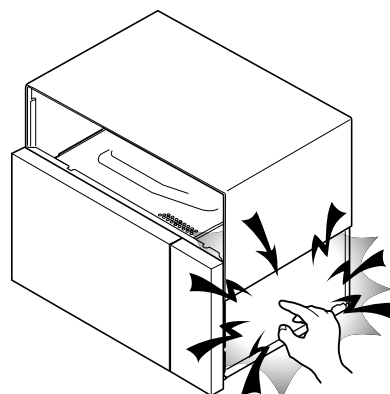
WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts may result in a severe, possibly fatal, electrical shock.

(Example)


High Voltage Capacitor, High Voltage Power Transformer, Magnetron, High Voltage Rectifier Assembly, High Voltage Harness etc..

Read the Service Manual carefully and follow all instructions.



**Don't Touch !
Danger High Voltage**

Before Servicing

1. Disconnect the power supply cord , and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

WARNING: RISK OF ELECTRIC SHOCK. DISCHARGE THE HIGH-VOLTAGE CAPACITOR BEFORE SERVICING.

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Whenever troubleshooting is performed the power supply must be disconnected. It may, in some cases, be necessary to connect the power supply after the outer case has been removed, in this event,

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect the leads to the primary of the power transformer.
5. Ensure that the leads remain isolated from other components and oven chassis by using insulation tape.
6. After that procedure, reconnect the power supply cord.

When the testing is completed,

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Reconnect the leads to the primary of the power transformer.
5. Reinstall the outer case (cabinet).
6. Reconnect the power supply cord after the outer case is installed.
7. Run the oven and check all functions.

After repairing

1. Reconnect all leads removed from components during testing.
2. Reinstall the outer case (cabinet).
3. Reconnect the power supply cord after the outer case is installed.
4. Run the oven and check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the power to HIGH and set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out **Before Servicing** procedure and re-examine the connections to the component being tested.

When all service work is completed and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test should be carried out.

MICROWAVE MEASUREMENT PROCEDURE

A. Requirements:

- 1) Microwave leakage limit (Power density limit): The power density of microwave radiation emitted by a microwave oven should not exceed 1 mW/cm^2 at any point 5cm or more from the external surface of the oven, measured prior to acquisition by a purchaser, and thereafter (through the useful life of the oven), 5 mW/cm^2 at any point 5cm or more from the external surface of the oven.
- 2) Safety interlock switches:
Primary interlock relay and door sensing switch shall prevent microwave radiation emission in excess of the requirement as above mentioned, secondary interlock switch shall prevent microwave radiation emission in excess of 5 mW/cm^2 at any point 5cm or more from the external surface of the oven.

B. Preparation for testing:

Before beginning the actual measurement of leakage, proceed as follows:

- 1) Make sure that the actual instrument is operating normally as specified in its instruction booklet.

Important:

Survey instruments that comply with the requirement for instrumentation as prescribed by the performance standard for microwave ovens, 21 CFR 1030.10(c)(3)(i), must be used for testing.

- 2) Place the oven tray in the oven cavity.
- 3) Place the load of $275 \pm 15\text{ ml}$ (9.8 oz) of tap water initially at $20 \pm 5^\circ\text{C}$ (68°F) in the center of the oven cavity.
The water container shall be a low form of 600 ml (20 oz) beaker with an inside diameter of approx. 8.5 cm (3-1/2 in.) and made of an electrically nonconductive material such as glass or plastic.
The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
- 4) Set the cooking control on Full Power Cooking Mode.
- 5) Close the door and select a cook cycle of several minutes. If the water begins to boil before the survey is completed, replace it with 275 ml of cool water.

C. Leakage test:

Closed-door leakage test (microwave measurement)

- 1) Grasp the probe of the survey instrument and hold it perpendicular to the gap between the door and the body of the oven.
- 2) Move the probe slowly, not faster than 1 in./sec. (2.5 cm/sec.) along the gap, watching for the maximum indication on the meter.
- 3) Check for leakage at the door screen, sheet metal seams and other accessible positions where the continuity of the metal has been breached (eg., around the switches, indicator, and vents).
While testing for leakage around the door pull the door away from the front of the oven as far as is permitted by the closed latch assembly.
- 4) Measure carefully at the point of highest leakage and make sure that the highest leakage is no greater than 4 mW/cm^2 , and that the secondary interlock switch and the primary interlock relay do turn the oven OFF before any door movement.

NOTE: After servicing, record data on service invoice and microwave leakage report.

SERVICE MANUAL

SHARP

TOASTER OVEN WITH MICROWAVE

R-55TS-F

FOREWORD

This Manual has been prepared to provide Sharp Electronics Corp. Service Personnel with Operation and Service Information for the SHARP TOASTER OVEN WITH MICROWAVE, R-55TS-F.

It is recommended that service personnel carefully study the entire text of this manual so that they will be qualified to render satisfactory customer service.

Check the interlock switches and the door seal carefully. Special attention should be given to avoid electrical shock and microwave radiation hazard.

WARNING

Never operate the oven until the following points are ensured.

- (A) The door is tightly closed.
- (B) The door brackets and hinges are not defective.
- (C) The door packing is not damaged.
- (D) The door is not deformed or warped.
- (E) There is no other visible damage with the oven.

Servicing and repair work must be carried out only by trained service personnel.

DANGER

Certain initial parts are intentionally not grounded and present a risk of electrical shock only during servicing. Service personnel - Do not contact the following parts while the appliance is energized;

**High Voltage Capacitor, Power Transformer, Magnetron, High Voltage Rectifier Assembly, High Voltage Harness;
If provided, Vent Hood, Fan assembly, Cooling Fan Motor.**

All the parts marked “*” on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to voltage above 250V.

All the parts marked “Δ” on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

PRODUCT DESCRIPTION

GENERAL INFORMATION

OPERATION

TROUBLESHOOTING GUIDE AND
TEST PROCEDURE

TOUCH CONTROL PANEL

COMPONENT REPLACEMENT
AND ADJUSTMENT PROCEDURE

WIRING DIAGRAM

PARTS LIST

SHARP ELECTRONICS CORPORATION

SHARP PLAZA, MAHWAH,
NEW JERSEY 07430-2135

SPECIFICATION

ITEM	DESCRIPTION
Power Requirements	120 Volts / 8.5 Amperes (Microwave)/ 10.8 Amperes (Grill and Bake) 60 Hertz / Single phase, 3 wire grounded
Power Output	650 watts (IEC TEST PROCEDURE) Operating frequency of 2450MHz
Upper Heater Power Output	760 Watts
Lower Heater Power Output	510 Watts
Case Dimensions	Width 17-3/4" Height 11-3/8" Depth 15-1/8"
Cooking Cavity Dimensions 0.5 Cubic Feet	Width 11-1/4" Height 5-7/8" Depth 11-5/8" NOTE: Internal capacity is calculated by measuring maximum width, depth and height. Actual capacity for holding food is less.
Control Complement	Touch Control System Clock (1:00 - 12:59) Timer (0 - 95 minutes) Microwave Power for Variable Cooking Repetition Rate; P100 Full power throughout the cooking time P-70 approx. 70% of Full Power P-50 approx. 50% of Full Power P-30 approx. 30% of Full Power P-10 approx. 10% of Full Power P-0 No power throughout the cooking time Grill cooking (GRILL) Top and bottom grill mode/ Top grill mode only Bake cooking (BAKE) 325 - 400°F temperature control AUTOMATIC COOKING pads (TOAST pad, SNACKS pad, BAKE pad) MICRO pad, GRILL pad, BAKE pad, POPCORN pad, REHEAT pad BEVERAGE pad, FROZEN ENTREES pad, FRESH VEGETABLES pad EXPRESS DEFROST pad, TIMER/CLOCK pad, STOP/CLEAR pad MINUTE PLUS/START pad
Oven Cavity Light	Yes
Safety Standard	UL Listed FCC Authorized DHHS Rules, CFR, Title 21, Chapter 1, Subchapter J

GENERAL INFORMATION

GROUNDING INSTRUCTIONS

This oven is equipped with a three prong grounding plug. It must be plugged into a wall receptacle that is properly installed and grounded in accordance with the National Electrical Code and local codes and ordinances.

In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current.

WARNING: Improper use of the grounding plug can result in a risk of electric shock.

Electrical Requirements

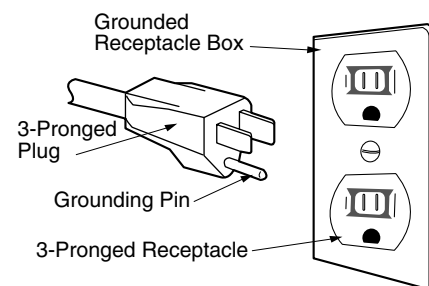
The electrical requirements are a 120 volt 60 Hz, AC only, 15 or more protected electrical supply. It is recommended that a separate circuit serving only this appliance be provided. When installing this appliance, observe all applicable codes and ordinances.

A short power-supply cord is provided to reduce risks of becoming entangled in or tripping over a longer cord.

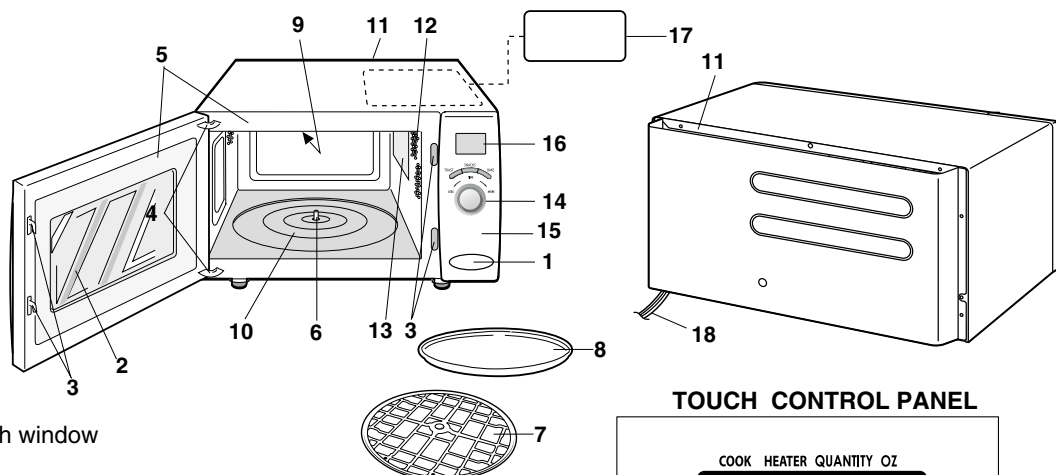
Where a two-pronged wall-receptacle is encountered, it is the personal responsibility and obligation of the customer to contact a qualified electrician and have it replaced with a properly grounded three-pronged wall receptacle or have a

grounding adapter properly grounded and polarized. If the extension cord must be used, it should be a 3-wire, 15 amp. or higher rated cord. Do not drape over a countertop or table where it can be pulled on by children or tripped over accidentally.

CAUTION: DO NOT UNDER ANY CIRCUMSTANCES CUT OR REMOVE THE ROUND GROUNDING PRONG FROM THIS PLUG.

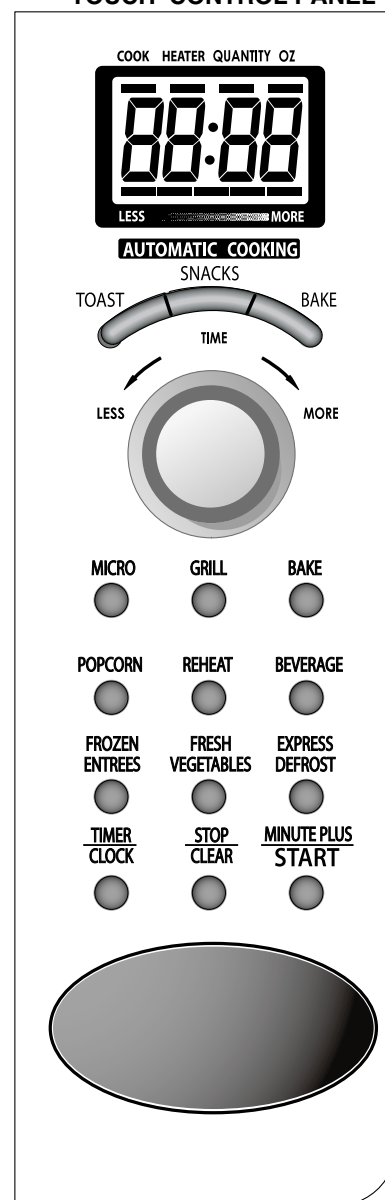


OVEN DIAGRAM



- 1 Door opening button
Push to open door.
- 2 Oven door with see-through window
- 3 Safety door latches
The oven will not operate unless the door is securely closed.
- 4 Door hinges
- 5 Door seals and sealing surfaces
- 6 Turntable motor shaft
- 7 Removable turntable support
Carefully place the turntable support on the turntable motor shaft(6) in the center of the oven floor.
- 8 Removable turntable
Place the turntable securely on the turntable support. The turntable will rotate clockwise or counterclockwise. Only remove for cleaning or for the foods specified in this manual.
- 9 Top grill heater (top heater)
- 10 Bottom grill heater (bottom heater)
The bottom heater is under the cavity floor.
- 11 Ventilation openings (rear)
- 12 Oven light
It will light when oven is operating or door is open.
- 13 Waveguide cover: DO NOT REMOVE.
- 14 Rotary dial
- 15 Control panel
- 16 Time display: 95 minutes
- 17 Food label
The food label in English and in Spanish is packed in the oven. Attach the selected one to the oven top.
- 18 Power supply cord

TOUCH CONTROL PANEL



NOTE:

Some one-touch cooking features such as "MINUTE PLUS" are disabled after three minutes when the oven is not in use. These features are automatically enabled when the door is opened and closed or the STOP/ CLEAR pad is pressed.

OPERATION

DESCRIPTION OF OPERATING SEQUENCE

The following is a description of component functions during oven operation.

OFF CONDITION

Closing the door activates the door sensing switch and secondary interlock switch. (In this condition, the monitor switch contacts are opened.)

When oven is plugged in, 120 volts A.C. is supplied to the noise filter and the control unit. (Figure O-1).

1. The display will show flashing "88 : 88".

To set any program or set the clock, you must first touch the STOP/CLEAR pad. The display will clear, and " : " will appear.

MICROWAVE COOKING CONDITION

Program desired cooking time by rotating the rotary dial. Program the power level by touching the MICRO pad.

When the START pad is touched, the following operations occur:

1. The contacts of relays are closed and components connected to the relays are turned on as follows.
(For details, refer to Figure O-2)

RELAY	CONNECTED COMPONENTS
RY-1	oven lamp/ turntable motor
RY-2	power transformer
RY-5	fan motor

2. 120 volts A.C. is supplied to the primary winding of the power transformer and is converted to about 3.3 volts A.C. output on the filament winding, and approximately 2000 volts A.C. on the high voltage winding.
3. The filament winding voltage heats the magnetron filament and the H.V. winding voltage is sent to a voltage doubler circuit.
4. The microwave energy produced by the magnetron is channelled through the waveguide into the cavity feed-box, and then into the cavity where the food is placed to be cooked.
5. Upon completion of the cooking time, the power transformer, oven lamp, etc. are turned off, and the generation of microwave energy is stopped. The oven will revert to the OFF condition.

NOTE: If the thermistor temperature is above 250°F(120°C), the circuit to RY5 will be maintained (by thermistor circuit) to continue operation of the cooling fan motor until the temperature drops below 250°F(120°C).

6. When the door is opened during a cook cycle, the monitor switch, door sensing switch, secondary interlock switch, relay (RY1) and primary interlock relay (RY2) are activated with the following results. The circuits to the turntable motor, the cooling fan motor, and the high

voltage components are de-energized, the oven lamp remains on, and the digital read-out displays the time still remaining in the cook cycle when the door was opened.

7. The monitor switch electrically monitors the operation of the secondary interlock switch and primary interlock relay and is mechanically associated with the door so that it will function in the following sequence.

(1) When the door opens from the closed position, the primary interlock relay (RY2) and secondary interlock switch open their contacts. And contacts of the relay (RY1) remains closed. Then the monitor switch contacts close.

(2) When the door is closed from the open position, the monitor switch contacts open first. Then the contacts of the secondary interlock switch and door sensing switch close. And contacts of the relay (RY1) open.

If the secondary interlock switch and primary interlock relay (RY2) fail with the contacts closed when the door is opened, the closing of the monitor switch contacts will form a short circuit through the monitor fuse, secondary interlock switch, relay (RY1) and primary interlock relay (RY2), causing the monitor fuse to blow.

POWER LEVEL P-0 TO P-90 COOKING

When Variable Cooking Power is programmed, the 120 volts A.C. is supplied to the power transformer intermittently through the contacts of relay (RY-2) which is operated by the control unit within a 32 second time base. Microwave power operation is as follows:

VARI-MODE	ON TIME	OFF TIME
P100 (100% power)	32 sec.	0 sec.
P-70 (approx. 70% power)	24 sec.	8 sec.
P-50 (approx. 50% power)	18 sec.	14 sec.
P-30 (approx. 30% power)	12 sec.	20 sec.
P-10 (approx. 10% power)	6 sec.	26 sec.
P-0 (approx. 0% power)	0 sec.	32 sec.

Note: The ON/OFF time ratio does not correspond with the percentage of microwave power, because approx. 3 seconds are needed for heating of the magnetron filament.

POWER OUTPUT REDUCTION

If the oven is set more than 20 minutes at MICRO 100% power level, after the first 20 minutes, the power level will automatically adjust to 70% to avoid overcooking.

GRILL COOKING CONDITIONS

The oven has two grill cooking conditions. They are the UPPER HEATER mode and UPPER AND LOWER HEATERS mode.

UPPER HEATER MODE (GRILL1)

In this mode, the food is cooked by the upper heater. Press the GRILL pad once and then enter the cooking time by rotating the rotary dial. When the START pad is pressed, the following operations occur (Figure O-3):

1. The relays (RY1, RY3 and RY5) are energized.
2. The numbers of the digital read-out start the count down to zero.
3. Then the upper heater, turntable motor, oven lamp and fan motor are energized.
4. Now, the food is grilled by the upper heater.
5. Upon completion of the selected cooking time, audible signal sounds and the contacts of relays (RY1, RY2 and RY3) are opened, then the upper heater, turntable motor and oven lamp are de-energized. But the relay (RY5) stays closed and the fan motor operates until the thermistor temperature drops below 250°F(120°C).

NOTE: Maximum cooking time is 30 minutes.

UPPER AND LOWER HEATERS MODE (GRILL 2)

In this mode, the food is cooked by both the upper heater and lower heater. Press the GRILL pad twice and then enter the cooking time by rotating the rotary dial. When the START pad is pressed, the following operations occur (Figure O-4):

1. The relays (RY1, RY3, RY4, and RY5) are energized.
2. The numbers of the digital read-out start the count down to zero.
3. Then the upper heater, lower heater, turntable motor, oven lamp and fan motor are energized.
4. Now, the food is grilled by the upper heater and the lower heater.
5. Upon completion of the selected cooking time, audible signal sounds and the contacts of relays (RY1, RY3, and RY4) are opened, then the upper heating elements, lower heating element, turntable motor and oven lamp are de-energized. But the relay (RY5) stays closed and the fan motor operates until the thermistor temperature drops below 250°F(120°C).

NOTE: Maximum cooking time is 30 minutes.

BAKE COOKING CONDITION

1. Program desired oven temperature by touching the BAKE pad. Enter the cooking time by rotating the rotary dial. When the START pad is touched, the following operations occur (Figure O-5):

[PREHEATING CONDITION]

2. The coil of shut-off relays (RY1, RY3, RY4 and RY5) are energized.
3. The numbers of the digital read-out start the count down to zero.
4. Then the upper heater, lower heater, turntable motor, oven lamp and fan motor are energized.
5. When the oven temperature reaches the selected preheat temperature, the following operations occur:
 - 5-1 The relays (RY3 and RY4) are de-energized by the control unit temperature circuit and thermistor, opening the circuit to the heating elements.

- 5-2. The oven will continue to function for 30 minutes, turning the upper heater and the lower heater on and off, as needed to maintain the selected preheat temperature. The oven will shutdown completely after 30 minutes

[BAKE TIME COOKING CONDITION]

6. When the preheat temperature is reached, a beep signal will sound indicating that the holding temperature has been reached in the oven cavity. Open the door and place the food to be cooked in the oven. In this time, to keep the oven temperature, the fan motor will not operate when the door is opened. When the START pad is touched, the following operations occur:
7. The numbers on the digital read-out start to count down to zero.
8. The relays (RY1, RY3, RY4 and RY5) are energized and the oven lamp, turntable motor and cooling fan motor are energized.
9. The relays (RY3 and RY4) are energized (if the cavity temperature is lower than the selected temperature) and the main supply voltage is applied to the heating elements to return to the selected cooking temperature.
10. Upon completion of the cooking time, the audible signal will sound, and oven lamp, turntable motor and cooling fan motor are de-energized. At the end of the Bake cooking cycle, if the thermistor temperature is above 250°F(120°C), the circuit to RY5 will be maintained (by the thermistor circuit) to continue operation of the cooling fan motor until the temperature drops below 250°F(120°C), at which time the relay will be de-energized, turning off the fan motor.

NOTE: The actual oven temperature may differ from the set temperature. Because the oven regulates the oven temperature by turning the upper and lower heaters on and off.

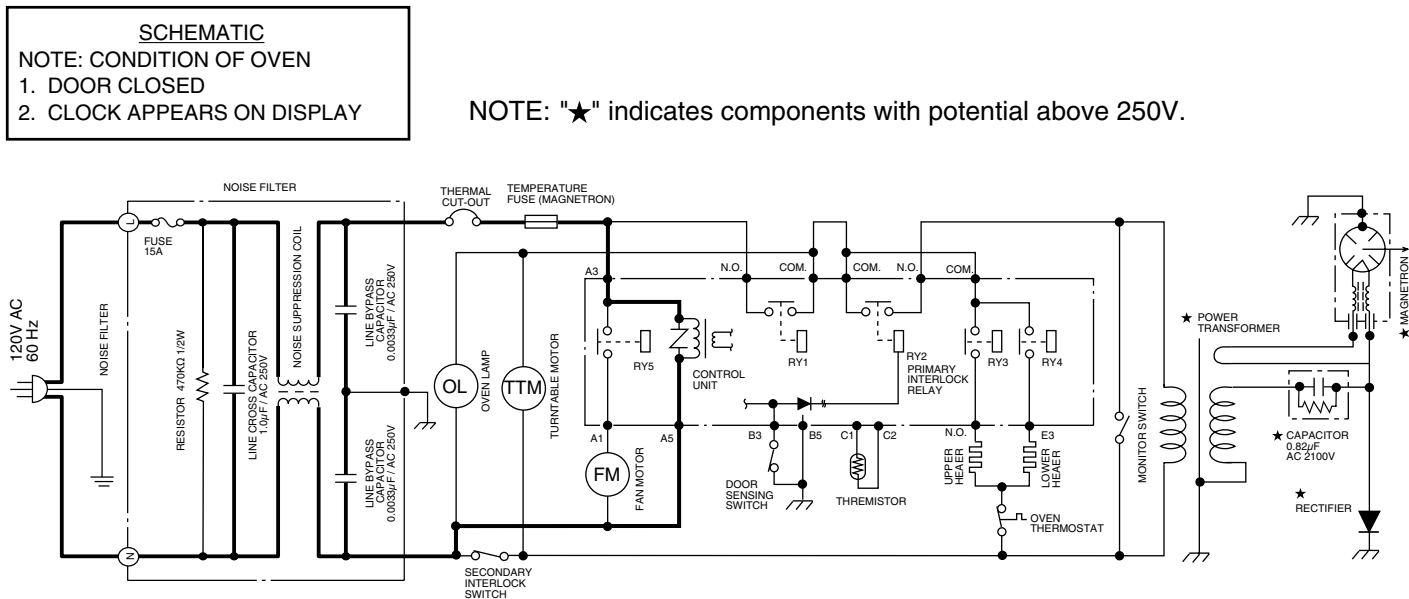


Figure O-1. Oven Schematic-Off Condition

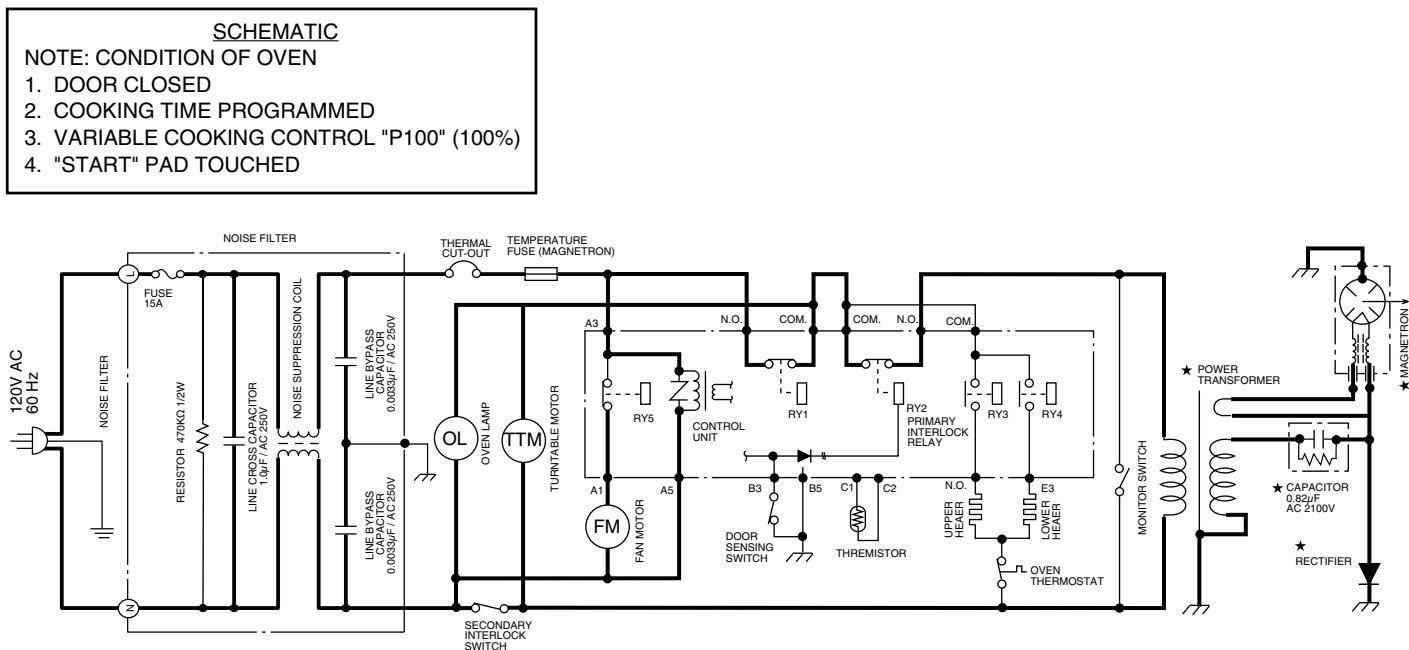


Figure O-2. Oven Schematic-Microwave Cooking Condition

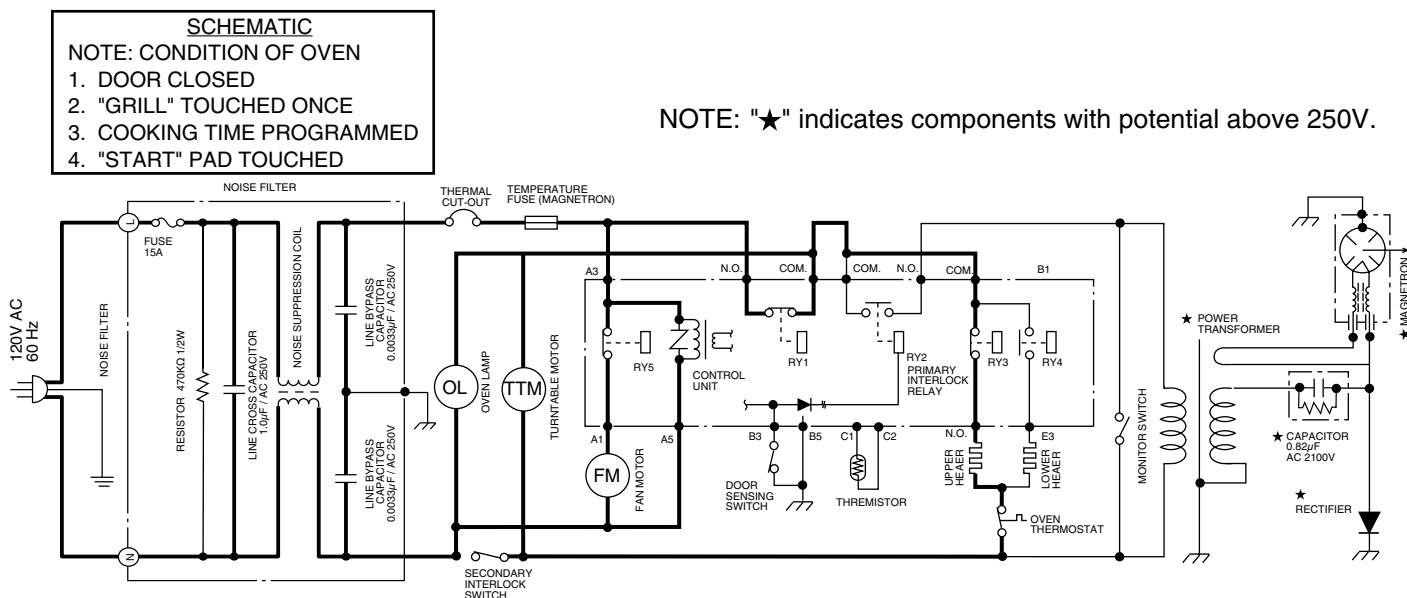


Figure O-3. Oven Schematic-GRILL1 Cooking Condition

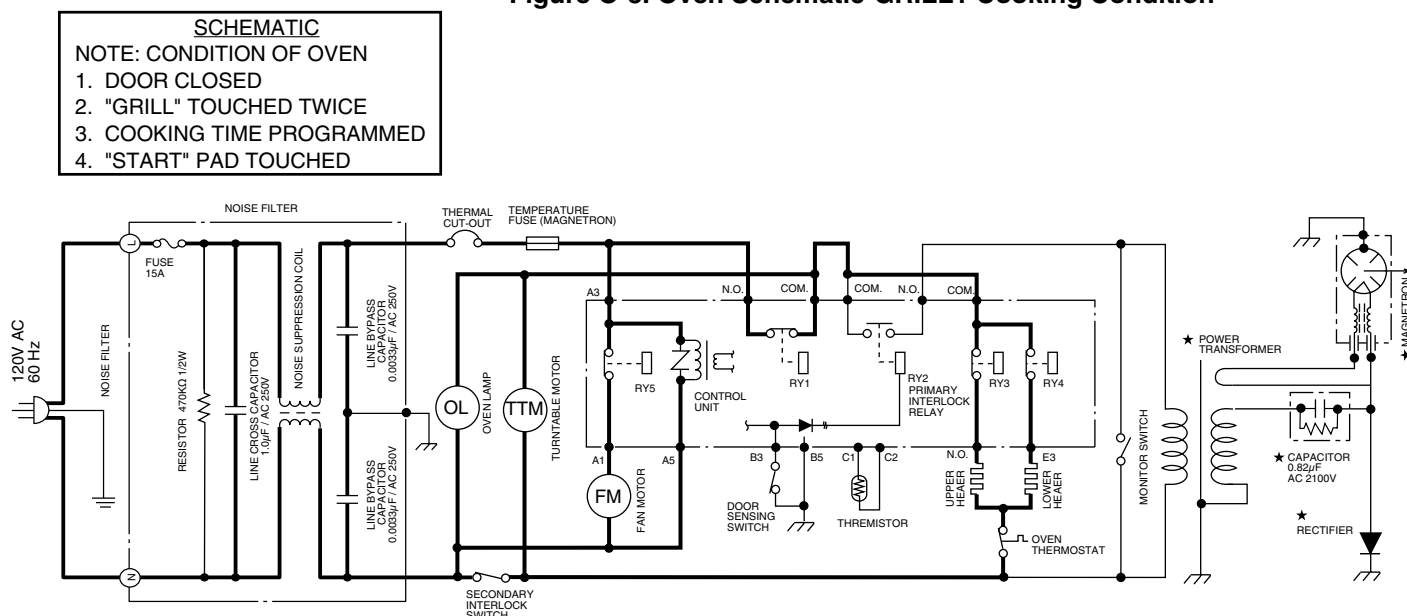


Figure O-4. Oven Schematic-GRILL2 Cooking Condition

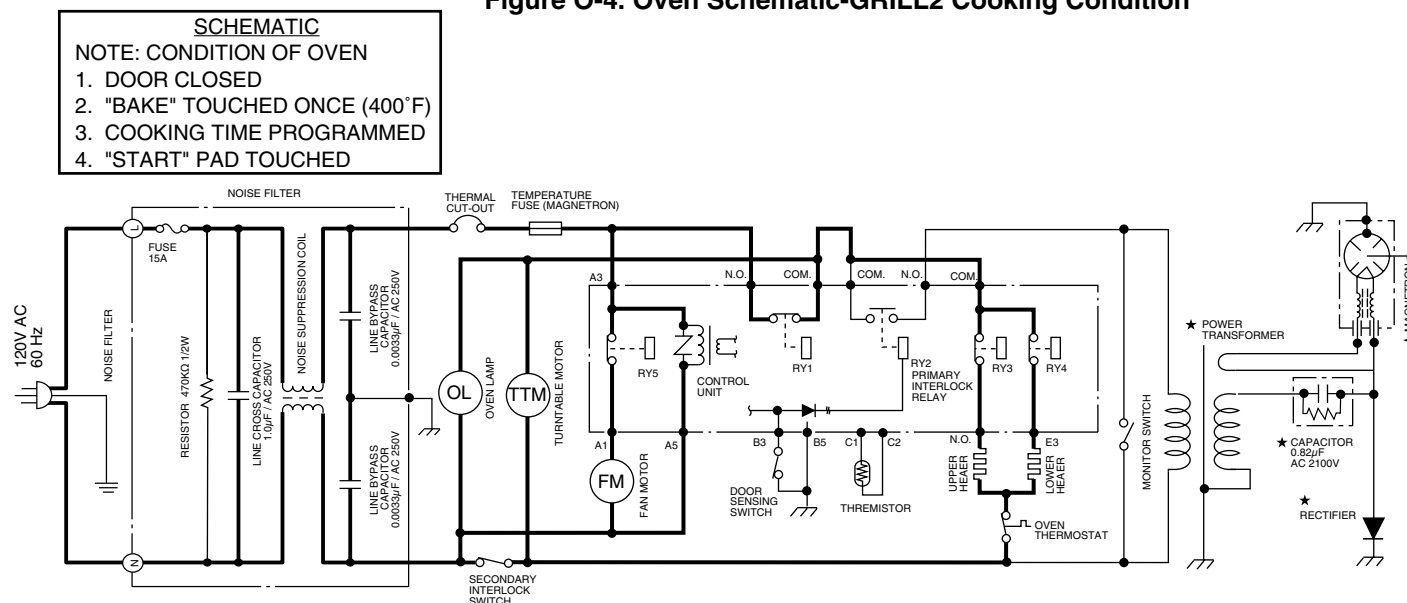


Figure O-5. Oven Schematic-BAKE Cooking Condition

DESCRIPTION AND FUNCTION OF COMPONENTS

DOOR OPEN MECHANISM

The door is opened by pushing the open button on the control panel, refer to the Figure D-1.

When the open button is pushed, the open button pushes up the switch lever, and then the switch lever pushes up the latch head. The latch heads are moved upward and released from latch hook. Now the door will open.

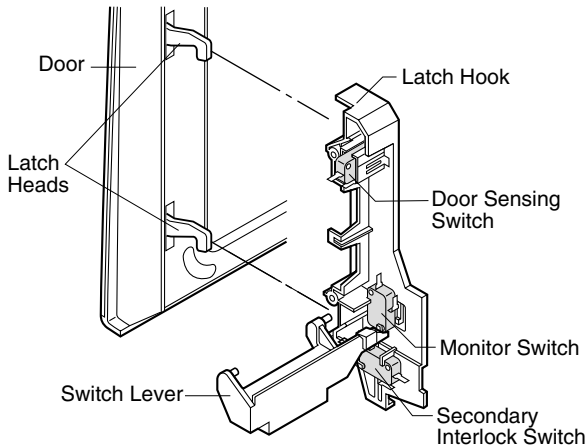


Figure D-1. Door Open Mechanism

DOOR SENSING AND SECONDARY INTERLOCK SWITCHES

The secondary interlock switch is mounted in the lower position of the latch hook and the door sensing switch in the primary interlock system is mounted in the upper position of the latch hook. They are activated by the latch heads on the door. When the door is opened, the switches interrupt the power to all high voltage components. A cook cycle cannot take place until the door is firmly closed thereby activating both interlock switches. The primary interlock system consists of the door sensing switch and primary interlock relay located on the control circuit board.

MONITOR SWITCH

The monitor switch is activated (the contacts opened) by the latch head on the door while the door is closed. The switch is intended to render the oven inoperative, by means of blowing the monitor fuse, when the contacts of the primary interlock relay (RY2), relay (RY1) and secondary interlock switch fail to open when the door is opened.

Functions:

1. When the door is opened, the monitor switch contacts close (to the ON condition) due to their being normally closed. At this time the primary interlock relay (RY2) and secondary interlock switch are in the OFF condition (contacts open) due to its being normally open contact switches. But the contacts of relay (RY1) are closed to turn on the oven lamp.
2. As the door goes to a closed position, the monitor switch contacts are first opened and then the door sensing switch and secondary interlock switch contacts close. At this time, the contacts of the relay (RY1) and the primary interlock relay (RY2) are in the OFF condition (contacts open)

3. If the door is opened, and the primary interlock relay (RY2) and the secondary interlock switch contact fail to open, the monitor fuse blows simultaneously with closing of the monitor switch contacts.

CAUTION: BEFORE REPLACING A BLOWN MONITOR FUSE, TEST THE DOOR SENSING SWITCH, RELAY (RY1), PRIMARY INTERLOCK RELAY (RY2), SECONDARY INTERLOCK SWITCH AND MONITOR SWITCH FOR PROPER OPERATION. (REFER TO CHAPTER "TEST PROCEDURE").

NOTE: MONITOR FUSE AND MONITOR SWITCH ARE REPLACED AS AN ASSEMBLY.

TURNTABLE MOTOR

The turntable motor rotates the turntable located on the bottom of the oven cavity, so that the food on the turntable is cooked evenly. The turntable may turn in either direction.

COOLING FAN MOTOR

The cooling fan motor drives a blade which draws external cool air. This cool air is directed through the air vents surrounding the magnetron and cools the magnetron. This air is channelled through the oven cavity to remove steam and vapours given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity.

THERMAL CUT-OUT 125°C

This thermal cut-out protects the upper heater against overheating. If the temperature goes up higher than 257°F (125°C) because the fan motor is interrupted or the ventilation openings are blocked, the thermal cut-out will open and line voltages to all electrical parts will be cut off and the operation of the oven will be stopped. The thermal cut-out will not resume.

OVEN THERMOSTAT

The oven thermostat is located on the top of the oven cavity. The oven thermostat will open at higher than 302°F (150°C). And the oven thermostat will close at lower than 266°F (130°C).

TEMPERATURE FUSE (MAGNETRON)

The temperature fuse, located near the magnetron, is designed to prevent damage to the magnetron. If an over heated condition develops in the magnetron due to cooling fan failure, obstructed air guide, dirty or blocked air intake, etc., the temperature fuse will open.

Under normal operation, the temperature fuse remains closed. However, when abnormally high temperatures are reached within the oven cavity, the temperature fuse will open at 302°F (150°C), causing the oven to shut down.

UPPER HEATER

The upper heater is located on the top of the oven cavity assembly. The upper heater sends out heat to cook foods.

LOWER HEATER

The lower heater is located under the bottom of the oven cavity assembly. The lower heater sends out heat to cook foods.

NOISE FILTER

The noise filter prevents the radio frequency interference that might flow back in the power unit.

TROUBLESHOOTING GUIDE

Never touch any part in the circuit with your hand or an uninsulated tool while the power supply is connected.

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure "section.

IMPORTANT: If the oven becomes inoperative because of a blown monitor fuse, check the monitor switch, primary interlock relay (RY2), door sensing switch and secondary interlock switch before replacing the monitor fuse. If monitor fuse is replaced, the monitor switch must also be replaced. Use part FFS-BA038WRKZ as an assembly.

IMPORTANT: Whenever troubleshooting is performed with the power supply cord disconnected. It may in, some cases, be necessary to connect the power supply cord after the outer case has been removed, in this event,

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect the leads to the primary of the power transformer.
5. Ensure that the leads remain isolated from other components and oven chassis by using insulation tape.
6. After that procedure, reconnect the power supply cord.

When the testing is completed,

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Reconnect the leads to the primary of the power transformer.
5. Reinstall the outer case (cabinet).
6. Reconnect the power supply cord after the outer case is installed.
7. Run the oven and check all functions.

CK = Check / RE = Replace

TEST PROCEDURE		A	B	C	D	E	E	E	F	F	G	H	I	I	J	L	M	N	O	O	O	O	O	P	Q	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
----------------	--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
A	<p><u>MAGNETRON ASSEMBLY TEST</u></p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. To test for an open filament, isolate the magnetron from the high voltage circuit. A continuity check across the magnetron filament leads should indicate less than 1 ohm. 5. To test for a shorted magnetron, connect the ohmmeter leads between the magnetron filament leads and chassis ground. This test should indicate an infinite resistance. If there is little or no resistance the magnetron is grounded and must be replaced. 6. Reconnect all leads removed from components during testing. 7. Reinstall the outer case (cabinet). 8. Reconnect the power supply cord after the outer case is installed. 9. Run the oven and check all functions. <p><u>MICROWAVE OUTPUT POWER</u></p> <p>The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted).</p> <p>HIGH VOLTAGES ARE PRESENT DURING THE COOK CYCLE, SO EXTREME CAUTION SHOULD BE OBSERVED.</p> <p>Power output of the magnetron can be measured by performing a water temperature rise test. This test should only be used if above tests do not indicate a faulty magnetron and there is no defect in the following components or wiring: silicon rectifier, high voltage capacitor and power transformer. This test will require a 16 ounce (453cc) measuring cup and an accurate mercury thermometer or thermocouple type temperature tester. For accurate results, the following procedure must be followed carefully:</p> <ol style="list-style-type: none"> 1. Fill the measuring cup with 16 oz. (453cc) of tap water and measure the temperature of the water with a thermometer or thermocouple temperature tester. Stir the thermometer or thermocouple through the water until the temperature stabilizes. Record the temperature of the water. 2. Place the cup of water in the oven. Operate oven at P100(100%) selecting more than 60 seconds cook time. Allow the water to heat for 60 seconds, measuring with a stop watch, second hand of a watch or the digital read-out countdown. 3. Remove the cup from the oven and again measure the temperature, making sure to stir the thermometer or thermocouple through the water until the maximum temperature is recorded. 4. Subtract the cold water temperature from the hot water temperature. The normal result should be 21.7 to 40.4°F(12.1 to 22.4°C) rise in temperature. If the water temperatures are accurately measured and tested for the required time period the test results will indicate if the magnetron tube has low power output (low rise in water temperature) which would extend cooking time or high power output (high rise in water temperature) which would reduce cooking time. Because cooking time can be adjusted to compensate for power output, the magnetron tube assembly should be replaced only if the water temperature rise test indicates a power output well beyond the normal limits. The test is only accurate if the power supply line voltage is 120 volts and the oven cavity is clean.
B	<p><u>POWER TRANSFORMER TEST</u></p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. Disconnect the primary input terminals and measure the resistance of the transformer with an ohmmeter. Check for continuity of the coils with an ohmmeter. On the R x 1 scale, the resistance of the primary coil should be less than 1 ohm and the resistance of the high voltage coil should be approximately 114 ohms; the resistance of the filament coil should be less than 1 ohm. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. <p>(HIGH VOLTAGES ARE PRESENT AT THE HIGH VOLTAGE TERMINAL, SO DO NOT ATTEMPT TO MEASURE THE FILAMENT AND HIGH VOLTAGE.)</p>

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
C	<p><u>HIGH VOLTAGE RECTIFIER TEST</u></p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. Isolate the rectifier from the circuit. Using the highest ohm scale of the meter, read the resistance across the terminals and observe, reverse the leads to the rectifier terminals and observe meter reading. If a short is indicated in both directions, or if an infinite resistance is read in both directions, the rectifier is probably defective and should be replaced. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. <p>NOTE: Be sure to use an ohmmeter that will supply a forward bias voltage of more than 6.3 volts.</p>
D	<p><u>HIGH VOLTAGE CAPACITOR TEST</u></p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. If the capacitor is open, no high voltage will be available to the magnetron. Disconnect input leads and check for a short or open between the terminals using an ohmmeter. Checking with a high ohm scale, if the high voltage capacitor is normal, the meter will indicate continuity for a short time and should indicate an open circuit once the capacitor is charged. If the above is not the case, check the capacitor with an ohmmeter to see if it is shorted between either of the terminals and case. If it is shorted, replace the capacitor. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions.
E	<p><u>OVEN THERMOSTAT</u></p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. A continuity check across the oven thermostat terminals should indicate a closed circuit unless the temperature of the oven thermostat reaches approximately 302°F(150°C). The oven thermostat resets automatically below approximately 266°F(130°C). 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. <p><u>THERMAL CUT-OUT TEST 125°C</u></p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. A continuity check across the thermal cut-out terminals should indicate a closed circuit. If the temperature of the thermal cut-out reaches approximately 257°F(125°C), the thermal cut-out opens. An open thermal cut-out indicates overheating of the upper heater, exchange the thermal cut-out. Check for restricted air flow to the upper heater, especially the cooling fan air guide. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. <p><u>TEMPERATURE FUSE (MAGNETRON) TEST</u></p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
	<ol style="list-style-type: none"> 3. Discharge high voltage capacitor. 4. A continuity check across the temperature fuse terminals should indicate a closed circuit unless the temperature of the magnetron reaches approximately 302°F(150°C). An open temperature fuse indicates overheating of the magnetron. Check for restricted air flow to the magnetron, especially the cooling fan and air guide. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. <p style="text-align: center;">CAUTION: IF THE THERMAL CUT-OUT, THERMOSTAT OR TEMPERATURE FUSE INDICATES AN OPEN CIRCUIT AT ROOM TEMPERATURE, REPLACE THERMAL CUT-OUT, THERMOSTAT OR TEMPERATURE FUSE.</p>
F	<p><u>SECONDARY INTERLOCK SWITCH TEST</u></p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. Isolate the switch and connect the ohmmeter to the common (COM.) and normally open (NO) terminal of the switch. The meter should indicate an open circuit with the door open and a closed circuit with the door closed. If improper operation is indicated, replace the secondary interlock switch. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. <p><u>PRIMARY INTERLOCK SYSTEM TEST</u></p> <p><u>DOOR SENSING SWITCH</u></p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. Isolate the switch and connect the ohmmeter to the common (COM.) and normally open (NO) terminal of the switch. The meter should indicate an open circuit with the door open and a closed circuit with the door closed. If improper operation is indicated, replace the door sensing switch. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. <p>NOTE: If the door sensing switch contacts fail in the open position and the door is closed, the turntable and oven light will be activated by relay(RY1).</p> <p><u>PRIMARY INTERLOCK RELAY (RY2)</u></p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. Disconnect two (2) wire leads from the male tab terminals of the Primary Interlock Relay. Check the state of the relay contacts using a ohmmeter. The relay contacts should be open. If the relay contacts are closed, replace the circuit board entirely or the relay itself. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions.
G	<p><u>MONITOR SWITCH TEST</u></p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. Before performing this test, make sure that the secondary interlock switch and the primary interlock relay

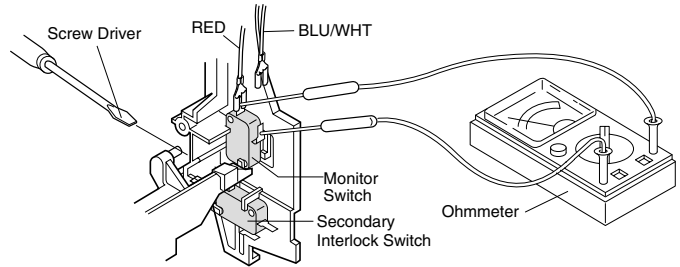
TEST PROCEDURES

PROCEDURE LETTER

COMPONENT TEST

are operating properly, according to the above Switch Test Procedure. Disconnect the wire lead from the monitor switch (COM) terminal. Check the monitor switch operation by using the ohmmeter as follows. When the door is open, the meter should indicate a closed circuit. When the monitor switch actuator is pushed by a screw driver through the lower latch hole on the front plate of the oven cavity with the door opened (in this condition the plunger of the monitor switch is pushed in), the meter should indicate an open circuit. If improper operation is indicated, the switch may be defective. After testing the monitor switch, reconnect the wire lead to the monitor switch (COM) terminal and check the continuity of the monitor circuit.

5. Reconnect all leads removed from components during testing.
6. Reinstall the outer case (cabinet).
7. Reconnect the power supply cord after the outer case is installed.
8. Run the oven and check all functions.



H

BLOWN MONITOR FUSE TEST

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. If the monitor fuse is blown when the door is opened, check the primary interlock relay (RY2), relay (RY1), secondary interlock switch and monitor switch according to the "TEST PROCEDURE" for those switches before replacing the blown Monitor fuse.

CAUTION: BEFORE REPLACING A BLOWN MONITOR FUSE, TEST THE PRIMARY INTERLOCK RELAY (RY2), RELAY (RY1), SECONDARY INTERLOCK SWITCH, DOOR SENSING SWITCH AND MONITOR SWITCH FOR PROPER OPERATION.

If the monitor fuse is blown by improper switch operation, the monitor fuse and monitor switch must be replaced with "monitor fuse and monitor switch assembly" part number FFS-BA038WRKZ, even if the monitor switch operates normally. The monitor fuse and monitor switch assembly is comprised of a 15 ampere fuse and switch.

5. Reconnect all leads removed from components during testing.
6. Reinstall the outer case (cabinet).
7. Reconnect the power supply cord after the outer case is installed.
8. Run the oven and check all functions.

I

UPPER HEATER AND LOWER HEATER TEST

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Make sure the heater is cooled completely.
5. Resistance of heater.
Disconnect the wire leads to the heater to be tested. Using ohmmeter with low resistance range. Check the resistance across the terminals of the heater as described in the following table.

Table: Resistance of heater

Parts name	Resistance
Upper heater	Approximately 18.9 Ω
Lower heater	Approximately 28.2 Ω

6. Insulation resistance.
Disconnect the wire leads to the heater to be tested. Check the insulation resistance between the heater terminal and cavity using a 500V - 100M Ω insulation tester. The insulation resistance should be more than 10 M Ω in the cold start.
7. If the results of above test 5 and/or 6 are out of above specifications, the heater is probably faulty and should be replaced.
8. Reconnect all leads removed from components during testing.

TEST PROCEDURES

PROCEDURE LETTER

COMPONENT TEST

9. Reinstall the outer case (cabinet).
10. Reconnect the power supply cord after the outer case is installed.
11. Run the oven and check all functions.

J

THERMISTOR TEST

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect connector-C from the control unit. Measure the resistance of the thermistor with an ohmmeter. Connect the ohmmeter leads to Pin No's 1 and 2.

Room Temperature	Resistance
68°F(20°C) - 86°F(30°C)	Approx. 293kΩ - 184KΩ

5. If the meter does not indicate above resistance, replace the thermistor
6. Reconnect all leads removed from components during testing.
7. Reinstall the outer case (cabinet).
8. Reconnect the power supply cord after the outer case is installed.
9. Run the oven and check all functions.

K

CHECKING TEMPERATURE IN THE PREHEAT OF BAKE MODE

The following test procedure should be carried out with the microwave oven is a fully assembled condition (outer case fitted).

It is difficult to measure the exact temperature in the oven. An accurate thermocouple type temperature tester must be used. A low priced bi-metal type thermometer is not reliable or accurate.

The temperature should be checked with outer case cabinet installed, approx. 5 minutes after preheat temperature is reached (audible signal sounds four times). The temperature experienced may be approx. 30°F more or less than indicated on the display, however, in most cases the food cooking results will be satisfactory.

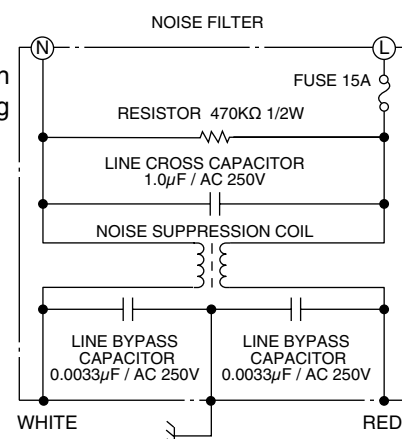
Difference in power supply voltage will also affect the oven temperature. The Household power supply voltage may sometimes become lower than the rated voltage (120 V) and cause under-cooking. If the power supply voltage is 10% lower than the rated voltage, longer cooking time is required by 10% to 20%.

L

NOISE FILTER TEST

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect the lead wires from the terminal the noise filter. Using an ohmmeter, check between the terminals as described in the following table. If incorrect reading are obtained, replace the noise filter.
5. Reconnect all leads removed from components during testing.
6. Reinstall the outer case (cabinet).
7. Reconnect the power supply cord after the outer case is installed.
8. Run the oven and check all functions.

MEASURING POINT	INDICATION OF OHMMETER
Between Hot and Neutral	Open circuit.
Between terminal N and WHITE	Short circuit.
Between terminal L and RED	Short circuit.



M

CONTROL UNIT TEST

The control unit consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance cannot be performed with only a voltmeter and ohmmeter.

In this service manual, the control unit is divided into two units, Power Unit and Switch Unit, and troubleshooting by unit replacement is described according to the symptoms indicated.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
	<p>Before testing,</p> <ol style="list-style-type: none"> 1) Disconnect the power supply cord, and then remove outer case. 2) Open the door and block it open. 3) Discharge high voltage capacitor. 4) Disconnect the leads to the primary of the power transformer. 5) Ensure that these leads remain isolated from other components and oven chassis by using insulation tape. <p>1. Switch Unit.</p> <p>NOTE ;</p> <ol style="list-style-type: none"> 1) Re-install the outer case (cabinet). 2) Reconnect the power supply cord after the outer case is installed. 3) Run the oven and check all functions. <p>The following symptoms indicate a defective switch unit.</p> <ol style="list-style-type: none"> a) When touching the pads, a certain pad produces no signal at all. b) When touching a number pad, two figures or more are displayed. c) When touching the pads, sometimes a pad produces no signal. d) When rotating the encoder (rotary dial), the cooking time can not be entered. <p>If the switch unit is defective, replace the switch unit together with the power unit.</p> <p>2. Power Unit.</p> <p>The following symptoms indicate a defective power unit. If the power unit is defective, replace the power unit together with the switch unit.</p> <p>2-1 In connection with pads.</p> <ol style="list-style-type: none"> a) When touching the pads, a certain group of pads do not produce a signal. b) When touching the pads, no pads produce a signal. <p>2-2 In connection with indicators</p> <ol style="list-style-type: none"> a) At a certain digit, all or some segments do not light up. b) At a certain digit, brightness is low. c) Only one indicator does not light. d) The corresponding segments of all digits do not light up; or they continue to light up. e) Wrong figure appears. f) A certain group of indicators do not light up. g) The figure of all digits flicker. <p>2-3 Other possible problems caused by defective control unit.</p> <ol style="list-style-type: none"> a) Buzzer does not sound or continues to sound. b) Clock does not operate properly. c) Cooking is not possible. d) Proper temperature measurement is not obtained. <p>When testing is completed,</p> <ol style="list-style-type: none"> 1) Disconnect the power supply cord, and then remove outer case. 2) Open the door and block it open. 3) Discharge high voltage capacitor. 4) Reconnect all leads removed from components during testing. 5) Re-install the outer case (cabinet). 6) Reconnect the power supply cord after the outer case is installed. 7) Run the oven and check all functions.

N

SWITCH UNIT TEST

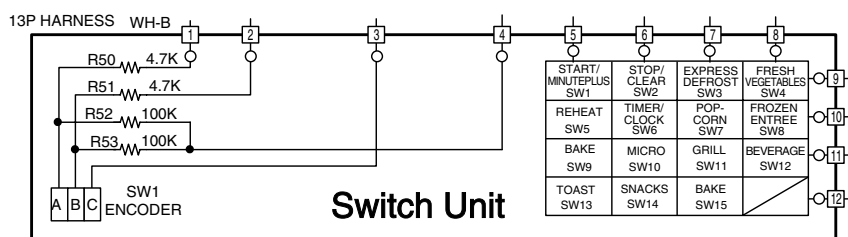
1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Using an ohmmeter and referring to the switch unit matrix indicated on the control unit circuit, check the circuit between the pins of the switch unit that correspond to the STOP/CLEAR pad. When the pad is pressed, the ohmmeter should indicate short circuit. When the pad is released, the ohmmeter should indicate open circuit. If incorrect readings are obtained, the key unit is faulty and must be replaced. About the other pads, the above method may be used.
5. Reconnect all leads removed from components during testing.
6. Re-install the outer case (cabinet).

TEST PROCEDURES

PROCEDURE LETTER

COMPONENT TEST

7. Reconnect the power supply cord after the outer case is installed.
8. Run the oven and check all functions.



O

RELAY TEST

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect the leads to the primary of the power transformer.
5. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
6. After that procedure, re-connect the power supply cord.
7. Remove the outer case and check voltage between Pin Nos. 1 and 3 of the 7 pin connector (A) on the control unit with an A.C. voltmeter.

The meter should indicate 120 volts, if not check oven circuit.

Shut off, Cook and Heater Relay Test

These relays are operated by D.C. voltage

Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation, grill cooking operation, or bake cooking operation.

DC. voltage indicated Defective relay.

DC. voltage not indicated Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	Approx. 24.2V D.C.	Oven lamp/ Turntable motor
RY2	Approx. 23.4V D.C.	Power transformer
RY3	Approx. 23.4V D.C.	Upper heater
RY4	Approx. 23.4V D.C.	Lower heater
RY5	Approx. 24.2V D.C.	Fan motor

8. Disconnect the power supply cord, and then remove outer case.
9. Open the door and block it open.
10. Discharge high voltage capacitor.
11. Reconnect all leads removed from components during testing.
12. Re-install the outer case (cabinet).
13. Reconnect the power supply cord after the outer case is installed.
14. Run the oven and check all functions.

P

EXPRESS DEFROST TEST

WARNING : The oven should be fully assembled before following procedure.

- (1) Place one cup of water in the center of the turntable tray in the oven cavity.
- (2) Close the door, touch the "Express Defrost" pad once and touch the "START" pad.
- (3) The oven is in Express Defrost cooking condition.
- (4) The oven will operate as follows

WEIGHT	1ST STAGE		2ND STAGE		3RD STAGE		4TH STAGE	
	LEVEL	TIME	LEVEL	TIME	LEVEL	TIME	LEVEL	TIME
0.5lb	70%	1min. 2sec.	0%	1min. 2sec.	50%	32sec.	30%	50sec.

- (5) If improper operation is indicated, the control unit is probably defective and should be checked.

TEST PROCEDURES

PROCEDURE LETTER

COMPONENT TEST

Q

FOIL PATTERN ON THE PRINTED WIRING BOARD TEST

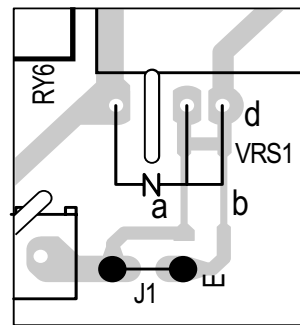
To protect the electronic circuits, this model is provided with a fine foil pattern added to the primary on the PWB, this foil pattern acts as a fuse.

1. Foil pattern check and repairs.

- 1) Disconnect the power supply cord, and then remove outer case.
- 2) Open the door and block it open.
- 3) Discharge high voltage capacitor.
- 4) Follow the troubleshooting guide given below for repair.

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder.
2	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d".

- 5) Make a visual inspection of the varistor. Check for burned damage and examine the transformer with a tester for the presence of layer short-circuit (check the primary coil resistance which is approximately $212\Omega \pm 10\%$). If any abnormal condition is detected, replace the control unit.



- 6) Reconnect all leads removed from components during testing.
 - 7) Re-install the outer case (cabinet).
 - 8) Reconnect the power supply cord after the outer case is installed.
 - 9) Run the oven and check all functions.
2. Follow the troubleshooting guide given below, if indicator does not light up after above check and repairs are finished.
- 1) Disconnect the power supply cord, and then remove outer case.
 - 2) Open the door and block it open.
 - 3) Discharge high voltage capacitor.
 - 4) Disconnect the leads to the primary of the power transformer.
 - 5) Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
 - 6) After that procedure, re-connect the power supply cord.
 - 7) Follow the troubleshooting guide given below for repair.

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present between Pin Nos. 1 and 3 of the 7-pin connector (A).	Check supply voltage and oven power cord.
2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and replace control unit.

- 8) Disconnect the power supply cord, and then remove outer case.
- 9) Open the door and block it open.
- 10) Discharge high voltage capacitor.
- 11) Reconnect all leads removed from components during testing.
- 12) Re-install the outer case (cabinet).
- 13) Reconnect the power supply cord after the outer case is installed.
- 14) Run the oven and check all functions.

TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOUCH CONTROL PANEL

The touch control section consists of the following units as shown in the touch control panel circuit.

- (1) Switch Unit
- (2) Power Unit

The principal functions of these units and signals communicated among them are explained below.

Switch Unit

The switch unit is composed of a matrix, signals generated in the LSI are sent to the switch unit from P14 - P17. When a key pad is touched, a signal is completed through the switch unit and passed back to the LSI through P24 - P27 to perform the function that was requested.

Encoder

The encoder converts the signal generated by LSI into the plus signal, and the plus signal is returned to the LSI.

Power Unit

Power unit consists of LSI, power source circuit, synchronizing signal circuit, ACL circuit, buzzer circuit, relay circuit, temperature measurement circuit and indicator circuit.

1) LSI

This LSI controls the temperature measurement signal, key strobe signal, relay driving signal for oven function and indicator signal.

2) Power Source Circuit

This circuit generates voltage necessary in the control unit.

Symbol	Voltage	Application
VC	-5.2V	LSI(IC1)

3) Synchronizing Signal Circuit

The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It accompanies a very small error because it works on commercial frequency.

4) Reset Circuit

A circuit to generate a signal which resets the LSI to the initial state when power is supplied.

5) Buzzer Circuit

The buzzer is responsive to signals from the LSI to emit audible sounds (key touch sound and completion sound).

6) Door Sensing Switch

A switch to "tell" the LSI if the door is open or closed.

7) Relay Circuit

To drive the magnetron, upper heater, lower heater, fan motor, turntable motor and light the oven lamp.

8) Indicator Circuit

This circuit consists of 4-digits, 13-segments and 3-common electrodes using a Liquid Crystal Display.

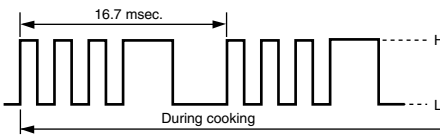
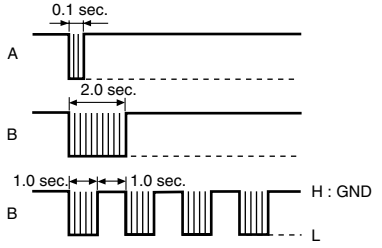
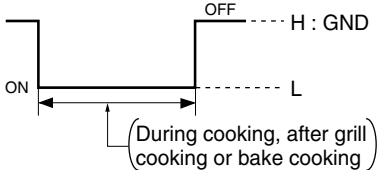
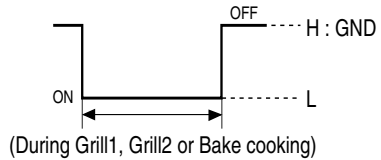
9) Temperature Measurement Circuit: (OVEN THERMISTOR)

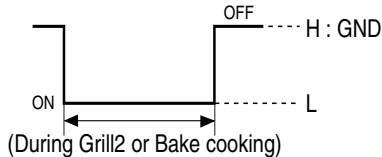
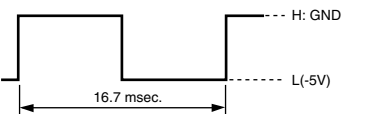
The temperature in the oven cavity is sensed by the thermistor. The variation of resistance according to sensed temperature is detected by the temperature measurement circuit and the result applied to LSI. The LSI uses this information to control the relay and display units.

DESCRIPTION OF LSI

LSI

The I/O signal of the LSI is detailed in the following table.

Pin No.	Signal	I/O	Description																		
1-2	VL2-VL1	IN	Power source voltage input terminal. Standard voltage for LCD.																		
3-5	AN7-AN5	IN	Terminal to change functions according to the model. DC voltage in accordance with the model in operation is applied to set up its function.																		
6	AN4	OUT	Terminal not used.																		
7	AN3	IN	Terminal not used.																		
8	AN2	IN	Input signal which communicates the door open/close information to LSI. Door closed; "H" level signal. Door opened; "L" level signal.																		
9	P61	OUT	Terminal not used.																		
10	P60	IN	Temperature measurement input: OVEN THERMISTOR. By inputting DC voltage corresponding to the temperature detected by the thermistor, this input is converted into temperature by the A/D converter built into the LSI.																		
11	P57	IN	Terminal not used.																		
12	P56	OUT	Oven lamp and turntable motor driving signal(Square Waveform : 60Hz). To turn on and off shut-off relay (RY1). The square waveform voltage is delivered to the relay (RY1) driving circuit. 																		
13	P55	OUT	Terminal not used.																		
14	P54	OUT	Signal to sound buzzer. A: key touch sound. B: Completion sound. C: When the temperature of the oven cavity reaches the preset temperature in the preheating mode, or when the preheating hold time (30 minutes) is elapsed. 																		
15	P53	OUT	Magnetron high-voltage circuit driving signal. To turn on and off the relay RY2. In 100% POWER operation, the signals hold "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (70%, 50%, 30%, 10%) the signal turns to "H" level and "L" level in repetition according to the power level. <table border="1" data-bbox="1067 1453 1442 1644"><caption>ON/OFF time ratio in micro cooking (a 32 second time base)</caption><thead><tr><th>MICRO COOK</th><th>ON</th><th>OFF</th></tr></thead><tbody><tr><td>100 %</td><td>32 sec.</td><td>0 sec.</td></tr><tr><td>70 %</td><td>24 sec.</td><td>8 sec.</td></tr><tr><td>50 %</td><td>18 sec.</td><td>14 sec.</td></tr><tr><td>30 %</td><td>12 sec.</td><td>20 sec.</td></tr><tr><td>10 %</td><td>6 sec.</td><td>26 sec.</td></tr></tbody></table>	MICRO COOK	ON	OFF	100 %	32 sec.	0 sec.	70 %	24 sec.	8 sec.	50 %	18 sec.	14 sec.	30 %	12 sec.	20 sec.	10 %	6 sec.	26 sec.
MICRO COOK	ON	OFF																			
100 %	32 sec.	0 sec.																			
70 %	24 sec.	8 sec.																			
50 %	18 sec.	14 sec.																			
30 %	12 sec.	20 sec.																			
10 %	6 sec.	26 sec.																			
16	P52	OUT	Fan motor driving signal. To turn on and off the fan motor relay RY5. "L" level during cooking, or after grill cooking or bake cooking. "H" level otherwise. 																		
17	P51	OUT	Upper heater driving signal. To turn on and off the upper heater relay (RY3). "L" level during GRILL1, GRILL2 cooking or Bake cooking. "H" level otherwise. 																		

Pin No.	Signal	I/O	Description
18	P50	OUT	Lower heater driving signal. To turn on and off the lower heater relay (RY4). "L" level during GRILL2 cooking or Bake cooking. "H" level otherwise. 
19-20	P47-P46	OUT	Terminal not used.
21	P45	OUT	Terminal not used.
22	P44	OUT	Terminal not used.
23	INT1	IN	Signal coming from encoder. When the encoder is turned, the contacts of encoder make plus signals. And plus signals are input into INT1.
24	INT0	IN	Signal to synchronized LSI with commercial power source frequency(60Hz). This is basic timing for time processing of LSI. 
25	P41	IN	Signal coming from encoder. Signal similar to INT1.Plus signals are input into P41.
26	P40	IN	Connected to VC.
27	RESET	IN	Auto clear terminal. Signal is input to reset the LSI to the initial state when power is applied. Temporarily set to "L" level the moment power is applied, at this time the LSI is reset. Thereafter set at "H" level.
28	P71	OUT	Timing signal output terminal for temperature measurement(OVEN THERMISTOR). "H" level (GND) : Thermistor OPEN timing. "L" level (-5V) : Temperature measuring timing. (Bake cooking)
29	P70	OUT	Terminal not used.
30	XIN	IN	Internal clock oscillation frequency input setting. The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XOUT terminal.
31	XOUT	OUT	Internal clock oscillation frequency control output. Output to control oscillation input of XIN.
32	VSS	IN	Power source voltage: -5V. VC voltage of power source circuit input.
33	P27	IN	Signal coming from touch tact switch. When any one of tact switches SW1, SW5, SW9, SW13 on switch unit matrix is touched, a corresponding signal from P14-P17 will be input into P27. When no tact switch is touched, the signal is held at "H" level.
34	P26	IN	Signal similar to P27. When any one of tact switches SW2, SW6, SW10, SW14 on switch unit matrix is touched, a corresponding signal will be input into P26.
35	P25	IN	Signal similar to P27. When any one of tact switches SW3, SW7, SW11, SW15 on switch unit matrix is touched, a corresponding signal will be input into P25.
36	P24	IN	Signal similar to P27. When any one of tact switches SW4, SW8, SW12 on switch unit matrix is touched, a corresponding signal will be input into P24.
37-40	P23-P20	OUT	Terminal not used.
41	P17	OUT	Tact switch strobe signal. Signal applied to tact switch section. A pulse signal is input to P24 - P27 terminal while one of tact swithes (SW1, SW2. SW3, SW4) on matrix is touched.
42	P16	OUT	Tact switch strobe signal. Signal applied to tact switch section. A pulse signal is input to P24 - P27 terminal while one of tact swithes (SW5, SW6. SW7, SW8) on matrix is touched.

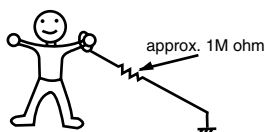
Pin No.	Signal	I/O	Description
43	P15	OUT	<u>Tact switch strobe signal.</u> Signal applied to tact switch section. A pulse signal is input to P24 - P27 terminal while one of tact swithes (SW9, SW10. SW11, SW12) on matrix is touched.
44	P14	OUT	<u>Tact switch strobe signal.</u> Signal applied to tact switch section. A pulse signal is input to P24 - P27 terminal while one of tact swithes (SW13, SW14. SW15) on matrix is touched.
45-48	P13-P10	IN	Terminal not used.
49-56	P07-P00	OUT	Terminal not used.
57-59	P37-P35	IN	Terminal not used.
60-72	SEG12-SEG0	OUT	<u>Segment data signal.</u> Connected to LCD. The relation between signals are as follows: <div style="display: flex; justify-content: space-between;"> <div> LSI signal (Pin No.) LCD (Pin No.) SEG 0 (72) SEG0 SEG 1 (71) SEG1 SEG 2 (70) SEG2 SEG 3 (69) SEG3 SEG 4 (68) SEG4 SEG 5 (67) SEG5 SEG 6 (66) SEG6 </div> <div> LSI signal (Pin No.) LCD (Pin No.) SEG7 (65) SEG7 SEG8 (64) SEG8 SEG9 (63) SEG9 SEG10 (62) SEG10 SEG11 (61) SEG11 SEG12 (60) SEG12 </div> </div>
73	VCC	IN	Connected to GND.
74	VREF	IN	Connected to GND.
75	AVSS	IN	Connected to VC.
76	COM3	OUT	Terminal not used.
77	COM2	OUT	<u>Common data signal.</u> Connected to LCD (COM2).
78	COM1	OUT	<u>Common data signal.</u> Connected to LCD (COM1).
79	COM0	OUT	<u>Common data signal.</u> Connected to LCD (COM0).
80	VL3	IN	<u>Power source voltage input terminal.</u> Standard voltage for LCD.

TOUCH CONTROL PANEL SERVICING

1. Precautions for Handling Electronic Components

This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc. and sometimes it is not fully protected by the built-in protection circuit. In order to protect CMOS LSI.

- 1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap all PW boards containing them in aluminium foil.
- 2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so. To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

(1) Servicing the touch control panel with power supply of the oven:

CAUTION:

THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING AND PRESENTS A HAZARD.

Therefore, before checking the performance of the touch control panel,

- 1) Disconnect the power supply cord, and then remove outer case.
- 2) Open the door and block it open.
- 3) Discharge high voltage capacitor.
- 4) Disconnect the leads to the primary of the power transformer.
- 5) Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
- 6) After that procedure, re-connect the power supply cord.

After checking the performance of the touch control panel,

- 1) Disconnect the power supply cord.
- 2) Open the door and block it open.
- 3) Re-connect the leads to the primary of the power transformer.
- 4) Re-install the outer case (cabinet).
- 5) Re-connect the power supply cord after the outer case is installed.
- 6) Run the oven and check all functions.

A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated. For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

B. On some models, the power supply cord between the touch control panel and the oven proper is long enough that they may be separated from each other. For those models, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which activates an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if dummy resistor(s) with resistance equal to that of the controls are used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which activates an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

3. Servicing Tools

Tools required to service the touch control panel assembly.

- 1) Soldering iron: 60W
(It is recommended to use a soldering iron with a grounding terminal.)
- 2) Oscilloscope: Single beam, frequency range: DC-10MHz type or more advanced model.
- 3) Others: Hand tools

4. Other Precautions

- 1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
- 2) Connect the connectors of the key unit to the control unit being sure that the lead wires are not twisted.
- 3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
- 4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
- 5) Be sure to use specified components where high precision is required.

PRECAUTIONS FOR USING LEAD-FREE SOLDER

1. Employing lead-free solder

The "Main PWB" of this model employs lead-free solder. This is indicated by the "LF" symbol printed on the PWB and in the service manual. The suffix letter indicates the alloy type of the solder.

Example:

LFa
Sn-Ag-Cu

Indicates lead-free solder of tin, silver and copper.

2. Using lead-free wire solder

When repairing a PWB with the "LF" symbol, only lead-free solder should be used. (Using normal tin/lead alloy solder may result in cold soldered joints and damage to printed patterns.)

As the melting point of lead-free solder is approximately 40°C higher than tin/lead alloy solder, it is recommend that a dedicated bit is used, and that the iron temperature is adjusted accordingly.

3. Soldering

As the melting point of lead-free solder (Sn-Ag-Cu) is higher and has poorer wettability, (flow), to prevent damage to the land of the PWB, extreme care should be taken not to leave the bit in contact with the PWB for an extended period of time. Remove the bit as soon as a good flow is achieved. The high content of tin in lead free solder will cause premature corrosion of the bit. To reduce wear on the bit, reduce the temperature or turn off the iron when it is not required.

Leaving different types of solder on the bit will cause contamination of the different alloys, which will alter their characteristics, making good soldering more difficult. It will be necessary to clean and replace bits more often when using lead-free solder. To reduce bit wear, care should be taken to clean the bit thoroughly after each use.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING AGAINST HIGH VOLTAGE:

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts may result in severe, possibly fatal, electric shock.

(Example)

High Voltage Capacitor, Power Transformer, Magnetron, High Voltage Rectifier Assembly, High Voltage Harness etc..

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Disconnect the power supply cord. 2. Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch leads to rise, it is then possible to hear a "click" as the door switches operate.) 3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.). | <ol style="list-style-type: none"> 1. Door does not close firmly. 2. Door hinge, support or latch hook is damaged. 3. The door gasket or seal is damaged. 4. The door is bent or warped. 5. There are defective parts in the door interlock system. 6. There are defective parts in the microwave generating and transmission assembly. 7. There is visible damage to the oven. |
|--|--|

Carry out any remedial work that is necessary before operating the oven.

Do not operate the oven if any of the following conditions exist;

- Do not operate the oven:
1. Without the RF gasket (Magnetron).
 2. If the wave guide or oven cavity are not intact.
 3. If the door is not closed.
 4. If the outer case (cabinet) is not fitted.

WARNING FOR WIRING

To prevent an electric shock, take the following precautions.

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Before wiring, <ol style="list-style-type: none"> 1) Disconnect the power supply cord. 2) Open the door block it open. 3) Discharge the high voltage capacitor and wait for 60 seconds. 2. Don't let the wire leads touch to the following parts; <ol style="list-style-type: none"> 1) High voltage parts:
Magnetron, Power transformer, High voltage capacitor and High voltage rectifier assembly. 2) Hot parts:
Upper heater, Lower heater, Oven lamp, Magnetron, Power transformer and Oven cavity. | <ol style="list-style-type: none"> 3) Sharp edge:
Bottom plate, Oven cavity, Waveguide flange and other metallic plate. 4) Movable parts (to prevent a fault)
Fan blade, Fan motor, Turntable motor, Switch, Switch lever, Open button. 3. Do not catch the wire leads in the outer case cabinet. 4. Insert the positive lock connector until its pin is locked and make sure that the wire leads do not come off even if the wire leads are pulled. 5. To prevent an error function, connect the wire leads correctly, referring to the Pictorial Diagram. |
|---|--|

Please refer to 'OVEN PARTS, CABINET PARTS, CONTROL PANEL PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

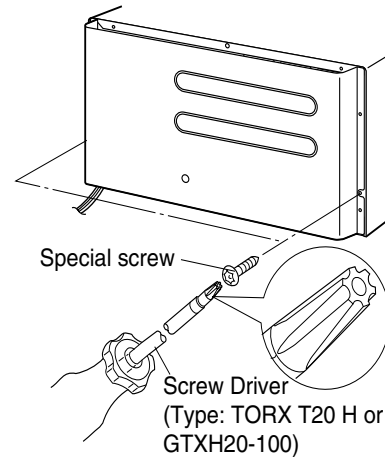
OUTER CASE REMOVAL

To remove the outer case, proceed as follows.

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Disconnect the power supply cord. 2. Open the door and block it open. 3. Remove the six (6) screws holding the rear cover to the rear reflector and the outer case cabinet. 4. Remove the two (2) screws holding the outer case cabinet to the bottom plate assembly, using a T20H Torx | <p>type of GTXH20-100 screw driver.</p> <ol style="list-style-type: none"> 5. Remove the remaining two (2) screws holding the outer case cabinet to the bottom plate assembly. 6. Slid the entire outer case back out about 1 inch (3cm) to free it from retaining clips on the cavity face plate. 7. Lift entire outer case from the unit. |
|---|--|

CAUTION: 1. DISCONNECT OVEN FROM POWER SUPPLY BEFORE REMOVING OUTER CASE.
2. DISCHARGE THE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENTS OR WIRING.

NOTE: When replacing the outer case, the 2 special Torx screws must be reinstalled in the same locations.



POWER TRANSFORMER REMOVAL

1. Disconnect the power supply cord and then remove outer case.
2. Open the oven door and block it open.
3. Discharge high voltage capacitor.
4. Remove two (2) screws holding the capacitor band with the high voltage capacitor to the bottom plate assembly.
5. Disconnect wire leads (primary) from power transformer and the filament leads and high voltage wire from the magnetron and capacitor terminals.
6. Remove four (4) screws holding transformer to bottom plate (from bottom side).
7. Remove transformer from bottom plate.

Reinstallation

1. Rest transformer on the bottom plate with its primary terminals toward the oven face plate.
2. Secure transformer with four (4) screws (from bottom side) to bottom plate.
3. Reconnect wire leads (primary) to power transformer and filament leads and high voltage wire of transformer to magnetron and high voltage capacitor. Refer to "PICTORIAL DIAGRAM".
4. Reinstall the capacitor band with the high voltage capacitor to the bottom plate assembly with two (2) screws.
5. Reinstall outer case and check that oven is operating properly.

HIGH VOLTAGE RECTIFIER AND HIGH VOLTAGE CAPACITOR REMOVAL

1. Disconnect the power supply cord and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect the high voltage wire of the power transformer from the high voltage capacitor.
5. Disconnect the high voltage wire of high voltage rectifier assembly from the magnetron.
6. Disconnect the filament lead (short one) of the power transformer from the high voltage capacitor.
7. Remove the two (2) screws holding capacitor holder to

bottom plate.

8. Remove one (1) screw holding high voltage rectifier assembly to capacitor holder.
9. Disconnect rectifier terminal from capacitor. High voltage rectifier assembly is now free.
10. Remove capacitor holder. Capacitor is now free.

CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER AND HIGH VOLTAGE CAPACITOR, GROUND SIDE TERMINAL OF THE HIGH VOLTAGE RECTIFIER MUST BE SECURED FIRMLY WITH A GROUNDING SCREW.

MAGNETRON REMOVAL

Removal

1. Disconnect the power supply cord and then remove the outer case.
2. Open the oven door and block it open.
3. Discharge the high voltage capacitor.
4. Disconnect all wire leads from the magnetron and the oven lamp.
5. Remove the two (2) screws holding the chassis support to the oven cavity front flange and the bottom plate assembly. And remove the chassis support.
6. Release the snap band of the main wire harness from the air duct.
7. Remove the one (1) screw holding the temperature fuse (magnetron) to the air duct.

8. Remove the one (1) screw holding the thermistor angle to the magnetron.
9. Carefully remove the three (3) screws holding the magnetron to the waveguide flange.
10. Remove the magnetron with care so that its antenna is not hit by any metal object.
11. Remove the two (2) screws holding the air duct to the magnetron and remove it.
12. Remove the two (2) screws holding the reflector to the magnetron and remove it.
13. Now, the magnetron is free.

Reinstallation

1. Reinstall the reflector to the magnetron with the two (2) screws.

2. Reinstall the air duct to the magnetron with the two (2) screws.
3. Reinstall the magnetron to the waveguide flange with the three (3) screws.
4. Reinstall the thermistor angle to the magnetron with the one (1) screw.
5. Reinstall the temperature fuse (magnetron) to the air duct with the one (1) screw.
6. Reinstall the snap band of the main wire harness to the air duct.

7. Reinstall the chassis support to the oven cavity front flange and the bottom plate assembly with the two (2) screws.
8. Reconnect the wire leads to the magnetron, oven lamp, referring to "PICTORIAL DIAGRAM".
9. Reinstall the outer case and check the oven is operating properly.

CAUTION: WHEN REPLACING MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND MOUNTING SCREWS ARE TIGHTENED SECURELY.

OVEN LAMP REMOVAL

1. Disconnect the power supply cord and then remove the outer case.
2. Open the oven door and block it open.
3. Discharge the high voltage capacitor.
4. Remove the magnetron with the air duct and the reflector

from the waveguide flange, referring to the items 4 -10 of "Removal of MAGNETRON REPLACEMENT"

5. Remove the one (1) screw holding the oven lamp to the air duct.
6. Now, the oven lamp is free.

POSITIVE LOCK® CONNECTOR (NO-CASE TYPE) REMOVAL

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Push the lever of positive lock® connector.
5. Pull down on the positive lock® connector.

CAUTION: WHEN CONNECTING THE POSITIVE LOCK® CONNECTORS TO THE TERMINALS, CONNECT THE POSITIVE LOCK® SO THAT THE LEVER FACES YOU

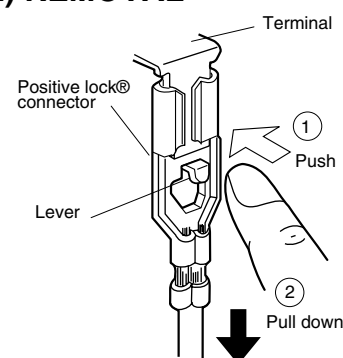


Figure C-1. Positive lock® connector

CONTROL PANEL ASSEMBLY REMOVAL

1. Disconnect the power supply cord and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect the wire leads and connectors from control unit.

5. Remove the one (1) screw holding the control panel assembly to the oven cavity front flange.
6. Slide the control panel assembly upward and remove it.
7. Now, individual components can be removed.

CONTROL UNIT ASSEMBLY REMOVAL

1. Disconnect the power supply cord and then remove the outer case.
2. Open the oven door and block it open.
3. Discharge the high voltage capacitor.
4. Remove the control panel assembly, referring to chapter of "CONTROL PANEL ASSEMBLY REMOVAL".
5. Disconnect the connector CN-D of the switch unit from the control unit.
6. Remove the four (4) screws holding the control unit to the control panel frame, and remove the control unit.

7. Remove the eight (8) screws holding the switch unit to the control panel frame, and remove the switch unit.
8. Pulling the timer knob and the switch unit at the same time, carefully remove the switch unit from the control panel frame so that the switch unit is not broken.
9. Now, the control unit assembly is free.

NOTE: When the switch unit is reinstalled, with fitting the "D" cut position of the rotaly encoder shaft and timer knob.

UPPER HEATER REMOVAL

1. Disconnect the power supply cord and then remove the outer case.

2. Open the oven door and block it open.
3. Discharge the high voltage capacitor.

4. Remove the two (2) screws holding the main wire harness to the upper heater.
5. Remove the one (1) screw holding the heater fix angle left to the oven cavity top plate.

6. Carefully remove the upper heater from the oven cavity top plate so that the right of the upper heater catch any metal object.
7. Now, the upper heater is free.

LOWER HEATER REMOVAL

1. Disconnect the power supply cord and then remove the outer case.
2. Open the oven door and block it open.
3. Discharge the high voltage capacitor.
4. Now, the rear cover should be removed.
5. Remove the turntable and the turntable support from the oven cavity.
6. Remove the door assembly, referring to "Removal of DOOR REPLACEMENT".
7. Remove the control panel assembly, referring to "CONTROL PANEL ASSEMBLY REMOVAL".
8. Remove the two (2) screws holding the rear reflector to the bottom plate assembly, and remove it.
9. Remove the two (2) screws holding the exhaust cover to the bottom plate assembly, and remove it.
10. Remove the two (2) screws holding the chassis support to the oven cavity front flange and the fan duct, and remove the chassis support.
11. Disconnect the wire leads from the following parts; Upper heater, Lower heater, Thermal cut out, Oven thermostat, Fan motor, C/T fuse, Door sensing switch, Monitor switch, Secondary interlock switch, Select relay, Oven lamp, Magnetron
12. Release the snap band of the main wire harness from the air duct.
13. Remove the power transformer, referring to "POWER TRANSFORMER REMOVAL".
14. Remove the three (3) screws holding the bottom plate assembly (rear side) to the oven cavity assembly.
15. Turn the oven over.
16. Remove the three (3) screws holding the door insertion barrier to the oven cavity.
17. Remove the bottom plate assembly with the main wire

harness from the oven cavity assembly.

18. Remove the three (3) screws holding the bottom reflector to the oven cavity.
19. Straighten the two (2) tabs of the bottom reflector and remove the bottom reflector from the oven cavity.
20. Lift up the stopper and remove the lower heater.
21. Now, lower heater is free.

NOTE 1. When the lower heater is reinstalled, insert the ceramic portion of the lower heater into the tab plate. Or cooking result will be bad.

2. When the lower heater is reinstalled, reinstall the lower heater so that the terminal of the lower heater faces toward the hole of the bottom reflector.

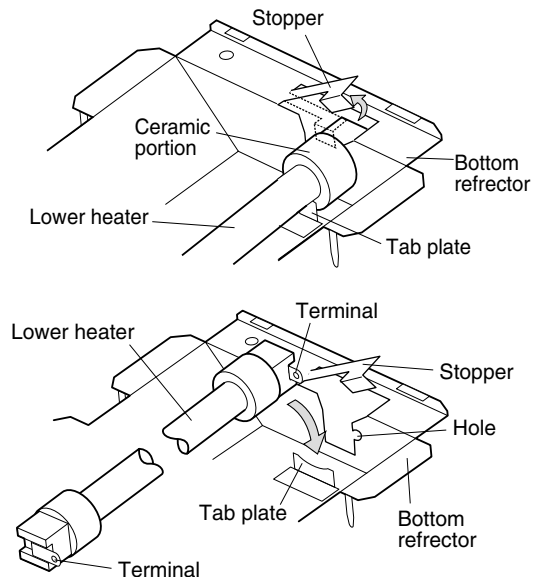


Figure C-2. Lower heater

TURNTABLE MOTOR REMOVAL

1. Disconnect the power supply cord.
2. Remove turntable and turntable support from oven cavity.
3. Lay the oven on it's backside. Remove the turntable motor cover by snipping off the material in eight (8) portions.
4. Where the corners have been snipped off bend corner areas flat. No sharp edges must be evident after removal of the turntable motor cover.

5. Disconnect wire leads from turntable motor.
6. Straighten the two (2) tabs holding turntable motor to turntable motor mounting angle.
7. Remove one (1) screw holding turntable motor to oven cavity.
8. Now the turntable motor is free.
9. After replacement use the one (1) screw to fit the turntable motor cover.

COOLING FAN MOTOR REMOVAL

REMOVAL

1. Disconnect the power supply cord and then remove outer case.
2. Open the door and block it open.

3. Discharge high voltage capacitor.
4. Disconnect the wire leads from the fan motor.
5. Remove the two (2) screws holding the fan motor to the bottom plate assembly.

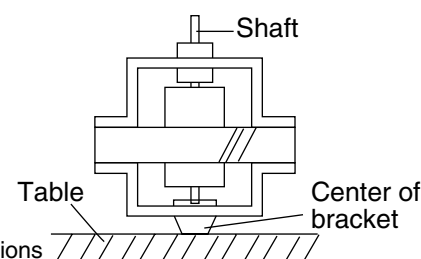
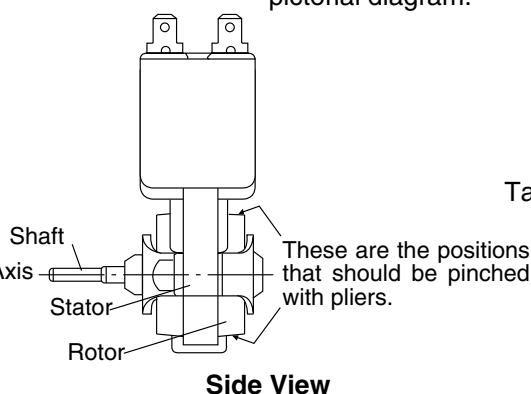
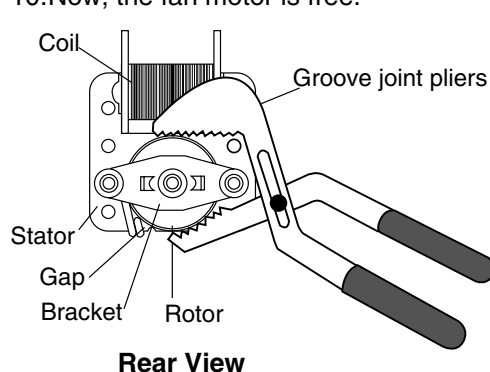
6. Remove the fan blade from the fan motor shaft according to the following procedure.
7. Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

CAUTION:

- * **Make sure that no metal pieces enter the gap between the rotor and the stator of the fan motor because the rotor is easily shaven by pliers and metal pieces may be produced.**
 - * **Do not touch the pliers to the coil of the fan motor because the coil may be cut or injured.**
 - * **Do not disfigure the bracket by touching with the pliers.**
8. Remove the fan blade from the shaft of the fan motor by pulling the fan blade with your hand.
 9. Now, the fan blade will be free.

CAUTION:

- * **Do not reuse the removed fan blade because the hole (for shaft) may be larger than normal.**
10. Now, the fan motor is free.



INSTALLATION

1. Install the fan blade to the fan motor shaft according to the following procedure.
2. Hold the center of the bracket which supports the shaft of the fan motor on the flat table.
3. Apply the screw lock tight into the hole (for shaft) of the fan blade.
4. Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.
5. Install the fan motor to the oven cavity back plate with the two (2) screws.

CAUTION:

- * **Do not hit the fan blade strongly when installed because the bracket may be disfigured.**
 - * **Make sure that the fan blade rotates smooth after installation.**
 - * **Make sure that the axis of the shaft is not slanted.**
6. Connect the wire leads to the fan motor, referring to the pictorial diagram.

DOOR SENSING SWITCH/SECONDARY INTERLOCK SWITCH AND MONITOR SWITCH REMOVAL

1. Disconnect the power supply cord and remove outer case.
 2. Open the door and block it open.
 3. Discharge high voltage capacitor.
 4. Remove the magnetron with air duct and the reflector from the waveguide flange, referring to the items 4 - 10 of "Removal of MAGNETRON REPLACEMENT".
 5. Remove the control panel assembly from the oven cavity front flange. Refer to the "CONTROL PANEL ASSEMBLY REMOVAL".
 6. Disconnect wire leads from the switches.
 7. Slide the switch lever rightward and remove it from the oven cavity front flange.
 8. Remove two (2) screws holding latch hook to oven flange.
 9. Remove latch hook assembly from oven flange.
 10. Push outward on the two (2) retaining tabs holding switch in place.
 11. Switch is now free.
- At this time switch lever will be free, do not lose it.

Reinstallation

1. Reinstall each switch in its place. The secondary interlock/monitor switches are in the lower position and the door sensing switch is in the upper position.
2. Secure latch hook (with two (2) mounting screws) to oven flange.
3. Reinstall the switch lever to the oven cavity front flange.
4. Reconnect wire leads to each switch. Refer to pictorial diagram.
5. Reinstall the control panel assembly to the oven cavity front with the one (1) screw.
6. Reinstall the magnetron with air duct and the reflector to the waveguide flange, referring to "Reinstallation of MAGNETRON REPLACEMENT".
7. Make sure that the monitor switch is operating properly and check continuity of the monitor circuit. Refer to chapter "Test Procedure" and Adjustment procedure.

DOOR SENSING SWITCH/SECONDARY INTERLOCK SWITCH AND MONITOR SWITCH ADJUSTMENT

1. Disconnect the power supply cord, and then remove outer case.
 2. Open the door and block it open.
 3. Discharge high voltage capacitor.
- If the door sensing switch, secondary interlock switch and monitor switch do not operate properly due to a

misadjustment, the following adjustment should be made.

- Loosen the two (2) screws holding latch hook to the oven cavity front flange.
- With door closed, adjust latch hook by moving it back and forth, and up and down. In and out play of the door allowed by the upper and lower position of the latch hook should be less than 0.5mm. The vertical position of the latch hook should be adjusted so that the door sensing switch and secondary interlock switch are activated with the door closed. The horizontal position of the latch hook should be adjusted so that the plunger of the monitor switch is pressed with the door closed.
- Secure the screws with washers firmly.
- Check the operation of all switches. If each switch has not activated with the door closed, loosen screw and adjust the latch hook position.

After adjustment, check the following.

- In and out play of door remains less than 0.5mm when in the latched position. First check upper position of latch hook, pushing and pulling upper portion of door toward the oven face. Then check lower portion of the latch hook, pushing and pulling lower portion of the door toward the oven face. Both results (play in the door)

should be less than 0.5mm.

- The door sensing switch and secondary interlock switch interrupt the circuit before the door can be open.
- Monitor switch contacts close when door is opened.
- Reinstall outer case and check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

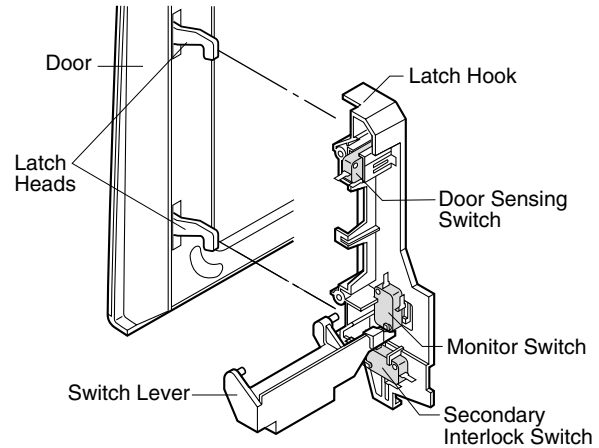


Figure C-3. Latch Switch Adjustments

DOOR REPLACEMENT

REMOVAL

- Disconnect the power supply cord.
- Open the door slightly.
- Insert a putty knife (thickness of about 0.5mm) into the gap between the choke cover and door stopper as shown in Figure C-4 to free engaging parts.
- Pry the choke cover by inserting a putty knife as shown Figure C-4.
- Release choke cover from door panel.
- Now choke cover is free.

NOTE: When carrying out any repair to the door, do not bend or warp the slit choke (tabs on the door panel assembly) to prevent microwave leakage.

- Release two (2) pins of door panel from two (2) holes of upper and lower oven hinges by lifting up.
- Now, door panel with door frame is free from oven cavity.

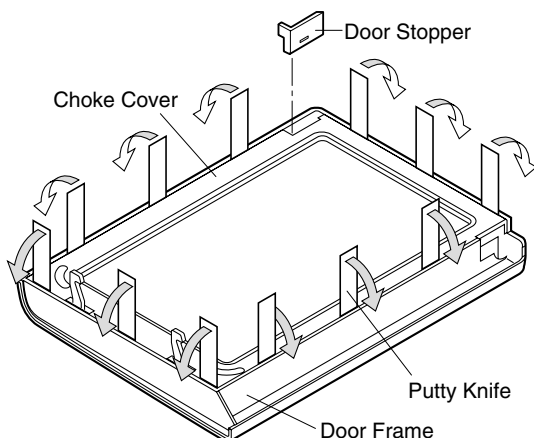


Figure C-4. Door Disassembly

- Remove the two (2) screws holding the door panel to the

door frame.

- Release door panel from eight (8) tabs of door frame.
- Now, door panel with sealer film is free.
- Tear sealer film from door panel.
- Now, door panel is free.
- Slide latch head upward and remove it from door frame with releasing latch spring from door frame and latch head.
- Now, latch head and latch spring are free.
- Remove the door glass stopper from door frame.
- Slide the front door glass rightward, then slide upward.
- Remove the front door glass from the door frame.
- Now, front door glass is free.
- Straight the twelve (12) tabs of the sus cover and remove the sus cover from the door frame.

REINSTALLATION

- Reinstall sus cover to the door frame .
- By bending the twelve (12) tabs of the sus cover, hold the sus cover to the door frame.
- Reinstall the front door glass to the door frame.
- 3-1. Insert the upper edge of the front door glass into the two (2) tabs of the door frame.
- 3-2. Slide the front door glass downwards and insert the lower edge of the front door glass into the four (4) tabs of the door frame.
- 3-3. Slide the front door glass leftward and insert the left edge of the front door glass into the three (3) long tabs of the door frame.
- Reinstall the door glass stopper so that the glass stopper catch the upper and right corner of the front door glass.
- Reinstall the latch spring to the latch head. Reinstall the latch spring to the door frame. Reinstall the latch head to

the door frame.

6. Reinstall the door panel to the door frame by fitting eight (8) tabs of the door frame.
7. Put the sealer film on the door panel. Refer to "Sealer Film" about how to handle new one.
8. Catch the two (2) pins of door panel on two (2) hole of the upper and lower oven hinges.
9. Reinstall the choke cover to the door panel by pushing.
10. Reinstall the door stopper.

Note: After any service to the door;

- (A) **Make sure that door sensing switch and secondary interlock switch are operating properly. (Refer to chapter "Test Procedures").**
- (B) **An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards.**

After any service, make sure of the following :

1. Door latch heads smoothly catch latch hook through latch holes and that latch head goes through center of latch hole.
2. Deviation of door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. Door is positioned with its face pressed toward cavity face plate.
4. Check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

Note: The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that door be air-tight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and do not of themselves indicate a leakage of microwave energy from oven cavity.

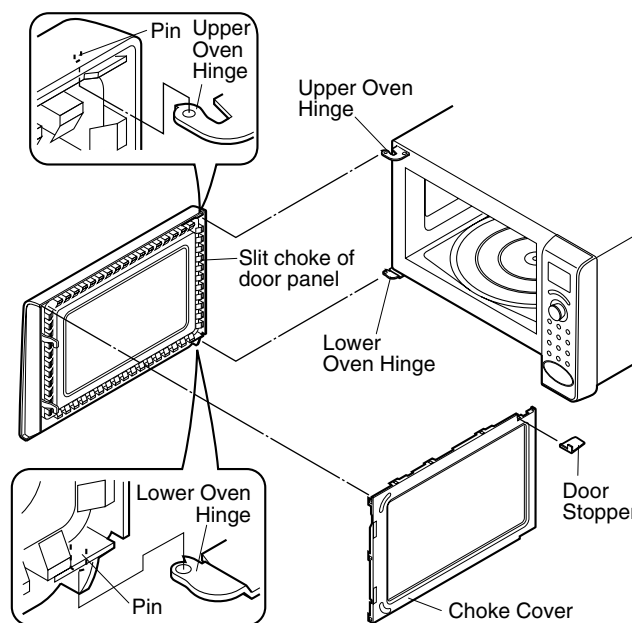


Figure C-5. Door Replacement

SEALER FILM

Installation

1. Put the adhesive tape on the backing film of the sealer film as shown in Fig. C-6.
2. Tear the backing film by pulling the adhesive tape.
3. Put the pasted side of the sealer film on the door panel

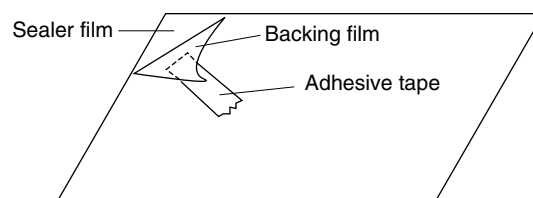


Figure C-6. Sealer film

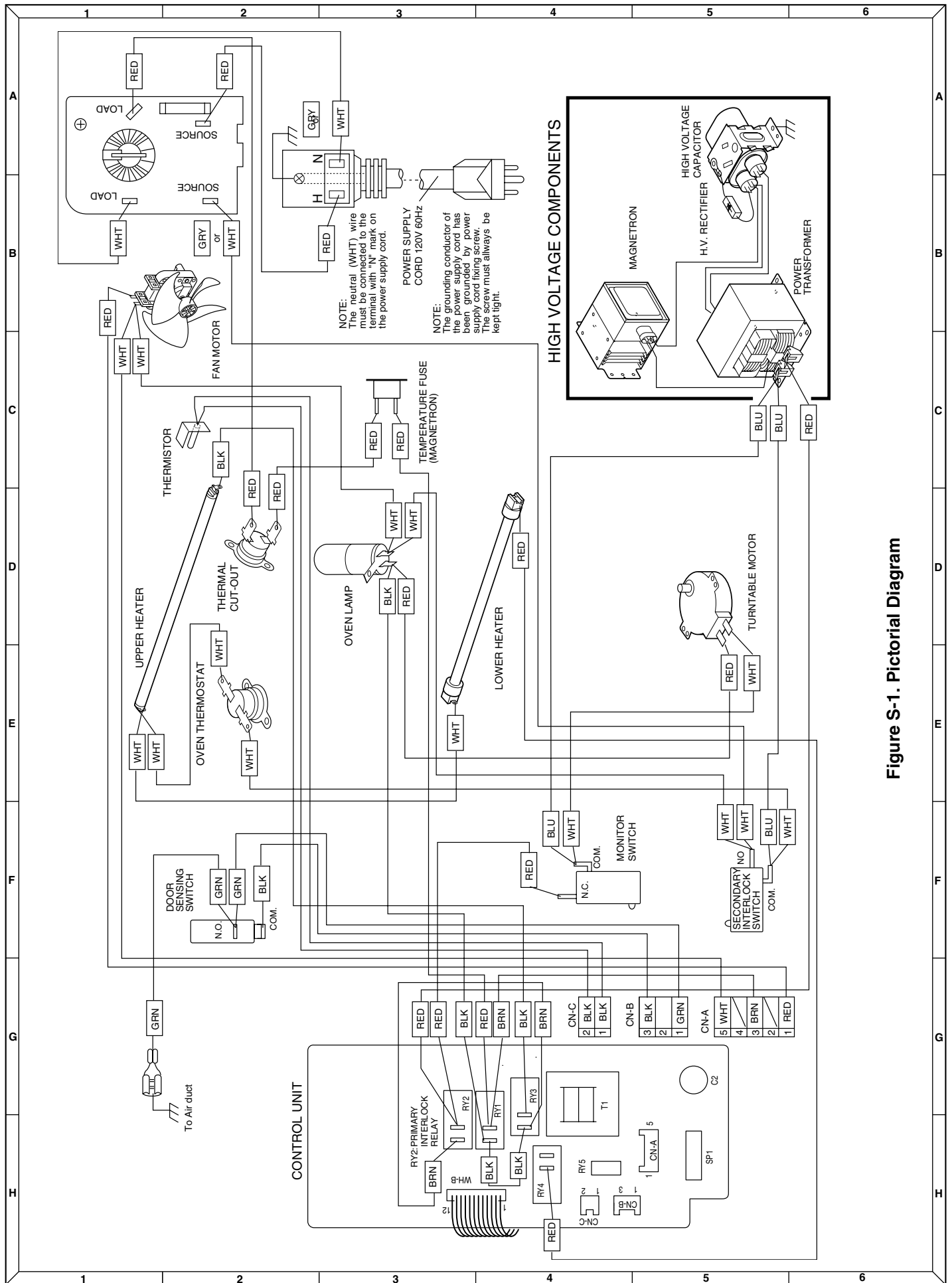


Figure S-1. Pictorial Diagram

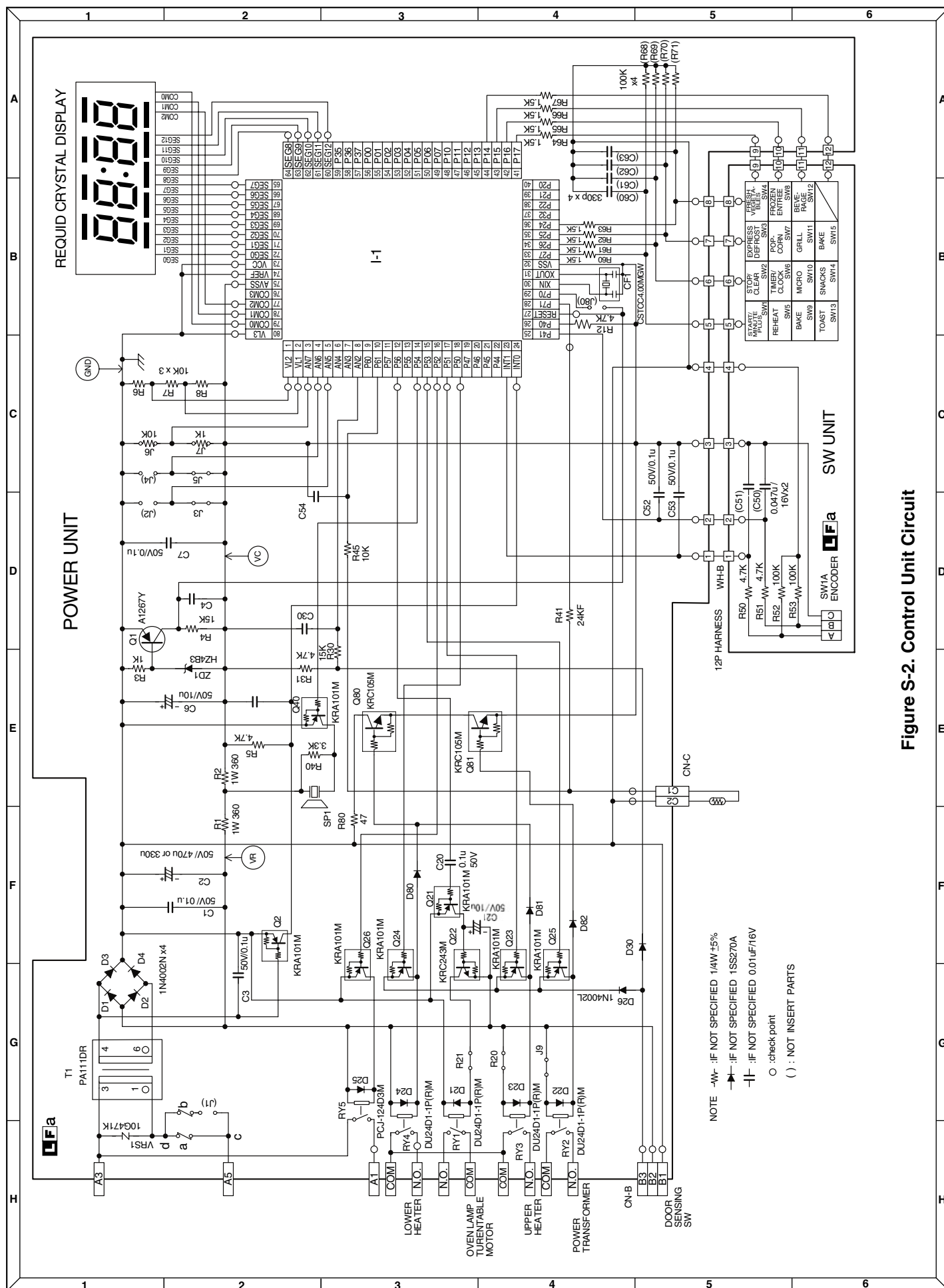
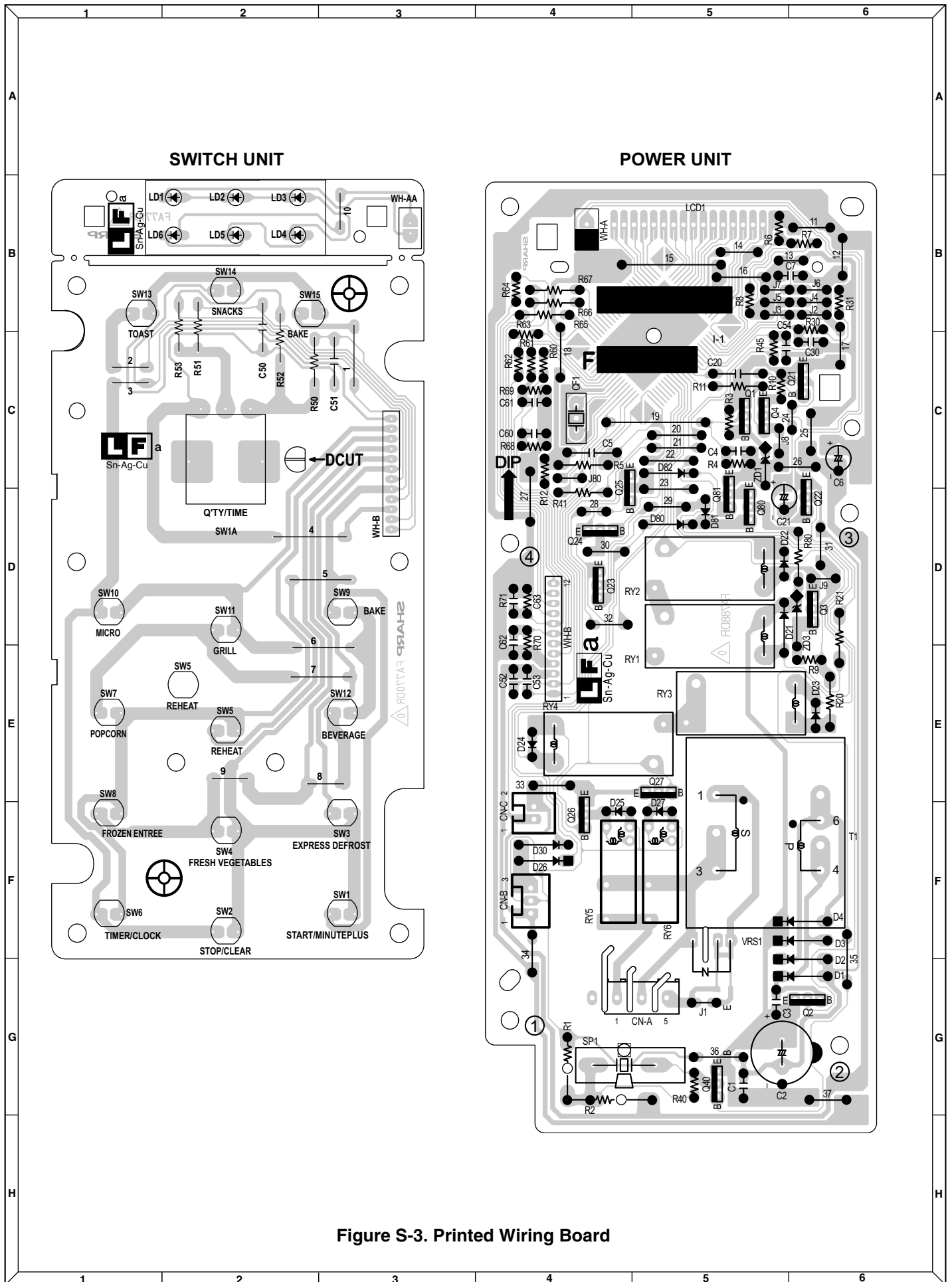


Figure S-2. Control Unit Circuit



PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure.

The parts marked "*" are used in voltage more than 250V.

The price codes marked "@" have been changed due to changing production to SATL.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
ELECTRIC PARTS				
1- 1	QSW-MA085WRE0	Secondary interlock switch / Door sensing switch	2	AF
1- 2	FFS-BA038WRKZ	Monitor fuse (15A) and monitor switch(V-5220Q) assembly	1	AP
1- 3	FH-HZA082WREZ	Thermistor assembly	1	AK
1- 4	FACCDAA089WREZ	Power supply cord	1	AS
1- 4	FACCDAA086WREZ	Power supply cord (Interchangeable)	1	AN
* 1- 5	RC-PZA041WRE0	High voltage capacitor	1	AS
* 1- 5	RC-QZA313WRZZ	High voltage capacitor (Interchangeable)	1	AP
* 1- 5	RC-QZA307WRZZ	High voltage capacitor (Interchangeable)	1	AX
* 1- 6	RH-DXA001WRZZ	High voltage rectifier	1	AG
* 1- 6	RH-DXA002WRZZ	" " " (Interchangeable) for production use	1	--
1- 7	RHET-A279WRZZ	Lower heater	1	AM
1- 8	RMOTEA420WRZZ	Fan motor	1	AU
1- 9	RMOTDA252WRZZ	Turntable motor	1	AN
1-10	RLMPTA082WRZZ	Oven lamp	1	AL
1-10	RLMPTA085WRZZ	Oven lamp (Interchangeable)	1	AH
Δ* 1-11	RV-MZA261WRE0	Magnetron	1	BF
* 1-13	RTRN-A719WRZZ	Power transformer	1	BE
1-14	RTHM-A133WRZZ	Oven thermostat 150C	1	AM
1-15	RTHM-A132WRZZ	Thermal cut out 125C	1	AM
1-16	RHET-A278WRZZ	Upper heater	1	AN
1-17	FPWBFA380WRKZ	Noise filter	1	AW
1-18	QFS-TA013WRE0	Temperature fuse 150C (Magnetron)	1	AG
CABINET PARTS				
2- 1	FDAI-A271WRKZ	Bottom plate assembly	1	AY
2- 2	GLEGPA091WREZ	Leg	4	AC
2- 3	GCABUA896WRPZ	Outer case cabinet	1	BD
CONTROL PANEL PARTS				
3- 1	DPWBFC384WRKZ	Control unit	1	BL
3- 2	FKNBKA217WRKZ	Timer knob assembly	1	AQ
3- 3	FPNLCB799WRKZ	Panel sub assembly	1	BB
3- 4	JBTN-B246WRFZ	Open button	1	AH
3- 5	JBTN-B247WRFZ	Select button	1	AQ
3- 6	MSPRCA143WREZ	Button spring	1	AE
3- 7	PCUSGA639WRPZ	LCD cushion A	1	AD
3- 8	PCUSGA640WRPZ	LCD cushion B	2	AD
3- 9	XEPS730P08000	Screw 3mm x 8mm	12	AA
OVEN PARTS				
Δ 4- 1	PHOK-A132WRFZ	Latch hook	1	AH
4- 2	LBNDKA164WRPZ	Capacitor band	1	AK
4- 3	PFPP-A220WREZ	Lower thermal insulation	1	AE
4- 4	PSLDHA180WRWZ	Bottom reflector	1	AM
4- 5	NFANJA050WREZ	Fan blade	1	AR
Δ 4- 6	xxxxxxxxxxxxxx	Oven cavity assembly (Not replaceable part)	1	--
4- 7	LANGKA933WRPZ	Sensor mounting angle	1	AL
4- 8	LANGKB054WRPZ	Shaft stopper	1	AM
4- 9	FSFTTA043WREZ	Turntable shaft assembly	1	AQ
4-10	LHLD-A220WRPZ	Turntable motor mounting angle	1	AL
4-11	NGERHA136WRFZ	Turntable gear A	1	AH
4-12	GGADUA002WREZ	Heater guard	1	AD
4-13	PDUC-A846WRPZ	Air duct	1	AH
4-14	PCUSGA505WRP0	Cushion	1	AB
4-15	PSPA-A135WREZ	Spacer	1	
4-16	LANGKB056WRPZ	Insertion barrier A	1	AE
4-17	PCUSGA643WRPZ	Cushion	1	AE
4-18	LANGQA604WRPZ	Thermistor angle	1	AF
4-19	LANGTA401WRPZ	Chassis support	1	AL
4-20	PCUSGA530WRE0	Cushion	1	AC
4-21	LSTPPA212WRFZ	Door stopper	1	AC
4-22	LANGKB053WRPZ	Door insertion barrier	1	AE
4-23	LANGKB048WRPZ	Fan duct	1	AP
4-24	MHNG-A518WRPZ	Lower oven hinge	1	AG
4-25	MHNG-A519WRPZ	Upper oven hinge	1	AG
4-26	LANGKB046WRPZ	Heater fix angle left	1	AF

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
4-27	LANGKB045WRPZ	Heater fix angle right	1	AL
4-28	PCUSGA630WRPZ	Cushion	1	AD
4-29	PDUC-A859WRPZ	Exhaust duct	1	AN
4-30	PSKR-A396WRPZ	Reflector right	1	AK
4-31	PSLDHA173WRPZ	Upper thermal cover	1	AK
4-32	PSLDHA175WRPZ	Left thermal cover	1	AG
4-33	MSPRCA150WREZ	Turntable spring	1	AF
4-34	PCOVPA369WREZ	Waveguide cover	1	AD
4-35	MLEVPA247WRFZ	Switch lever	1	AF
4-36	GCOVAA321WRPZ	Exhaust cover	1	AH
4-37	GCOVAA322WRPZ	Rear cover	1	AR
4-38	PSKR-A395WRPZ	Rear reflector	1	AE
4-39	LANGQA591WRPZ	Noise filter angle	1	AN
4-40	PCUSGA485WRE0	Cushion	1	AD

DOOR PARTS

Δ	5	DDORFB080WRKZ	Door assembly	1	BM
Δ	5- 1	GCOVHA457WRFZ	Choke cover	1	AT
Δ	5- 2	LSTPPA221WRFZ	Latch head	1	AH
Δ	5- 3	LSTPPA222WRFZ	Glass stopper	1	AF
Δ	5- 4	FDORFA370WRKZ	Door panel	1	BD
	5- 5	MSPRTA218WREZ	Latch spring	1	AE
	5- 6	PGLSPA591WREZ	Front door glass	1	AY
	5- 7	XEPS740P10000	Screw : 4mm x 8mm	2	AA
	5- 8	FWAKPA401WRKZ	Door frame assembly	1	BK

MISCELLANEOUS

6- 1	FTNT-A048WRMZ	Turntable support	1	AQ
6- 2	TINSEB028WRRZ	Operation manual	1	AM
6- 3	TLABMA911WRRZ	Menu label	1	AE
6- 4	NTNT-A070WRH0	Turntable	1	AR
6- 5	FW-VZC004WREZ	Main wire harness	1	AZ
6- 6	TCAUAA293WRRZ	Monitor caution	1	AF
6- 7	TCAUAA265WRRZ	DHHS caution label	1	AC
6- 8	LBNDKA166WREZ	Wire holder	1	AD

SCREWS,NUTS AND WASHERS

7- 1	XTTS740P06000	Screw : 4mm x 6mm	2	AB
7- 2	XFPS740P10000	Screw : 4mm x 10mm	3	AB
7- 3	XHTS740P08000	Screw : 4mm x 8mm	3	AC
7- 4	XHPS740P08K00	Screw : 4mm x 8mm	2	AB
7- 5	XHPS730P06000	Screw : 3mm x 6mm	5	AB
7- 7	LX-BZA148WREZ	Special screw	6	AC
7- 8	XHPS740P08000	Screw : 4mm x 8mm	4	AB
7- 9	LX-BZA128WRE0	Special screw	1	AB
7-10	LX-CZ0052WRE0	Special screw	2	AA
7-11	LX-CZA070WRE0	Special screw (Torx tamper proof screw)	2	AC
7-12	XFTS740P10000	Screw : 4mm x 10mm	2	
7-13	XHTS740P08RV0	Screw : 4mm x 8mm	4	AG
7-14	LX-BZA144WREZ	Special screw	4	AB
7-15	XOTWW40P10000	Screw : 4mm x 10mm	1	AA
7-16	XHTS740P12RV0	Screw : 4mm x 12mm	5	AC
7-18	XNEUW30-24000	Nut : 3mm x 2, .4m	1	AB
7-19	XOTS740P08000	Screw : 4mm x 8mm	19	AA
7-20	XOTS740P10000	Screw : 4mm x 10mm	12	AA
7-21	XEPS740P08000	Screw : 4mm x 8mm	1	AB
7-22	XOTS740P12000	Screw : 4mm x 12mm	1	AA

HOW TO ORDER REPLACEMENT PARTS

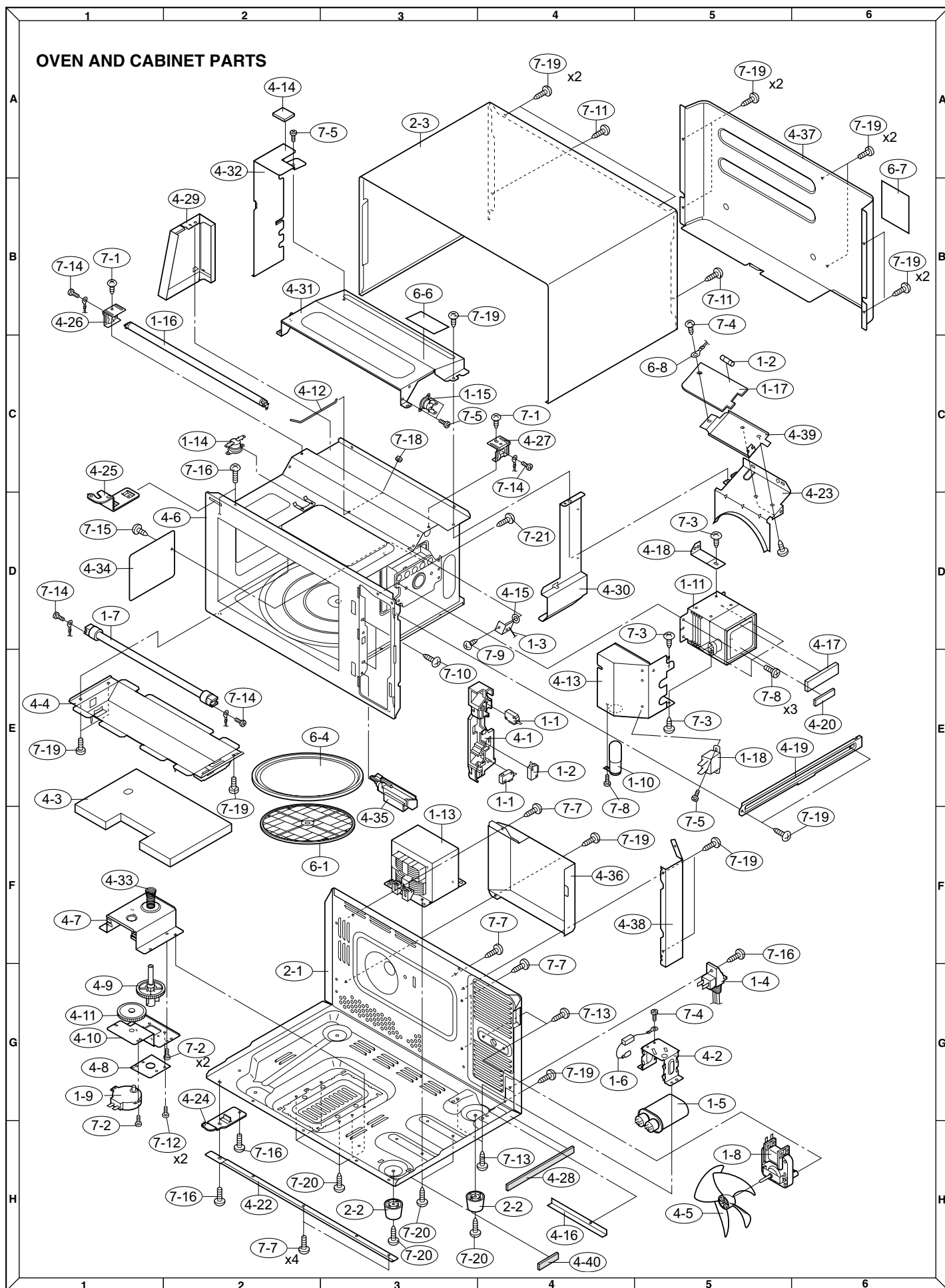
To have your order filled promptly and correctly, please furnish the following information.

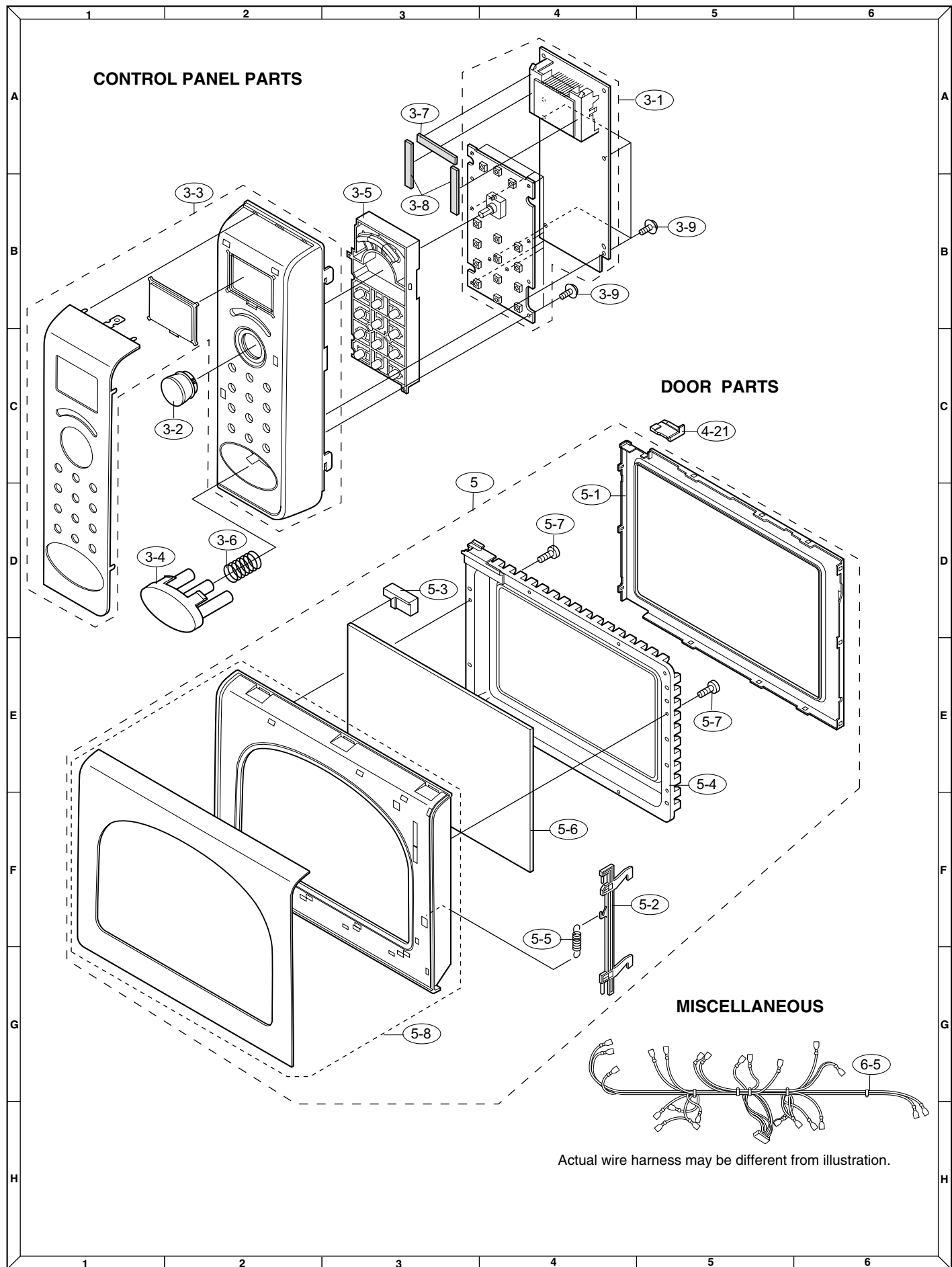
1. MODEL NUMBER 2. REF. NO. 3. PART NO. 4. DESCRIPTION

Order Parts from the authorized SHARP parts Distributor for your area.

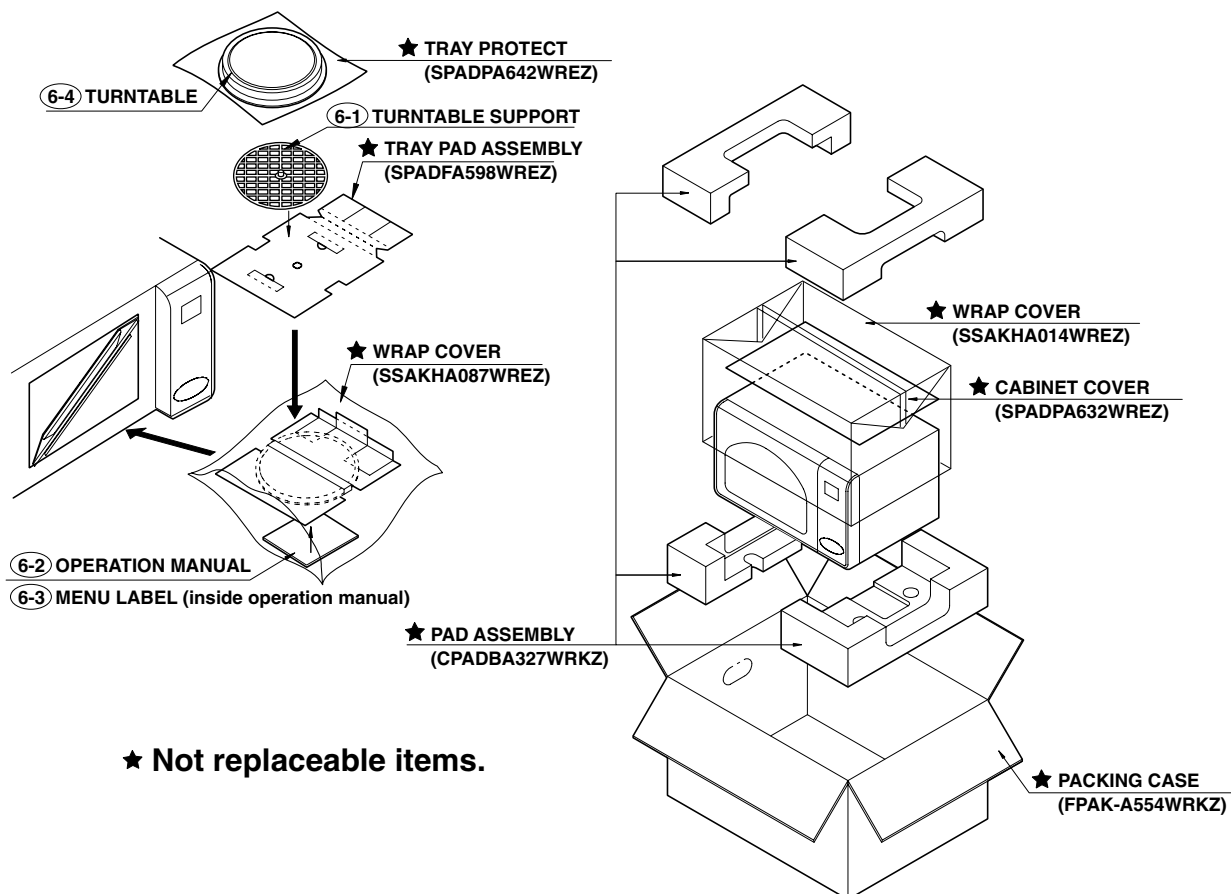
Defective parts requiring return should be returned as indicated in the Service Policy.

OVEN AND CABINET PARTS





PACKING AND ACCESSORIES



SHARP

COPYRIGHT © 2005 BY SHARP CORPORATION

ALL RIGHTS RESERVED.

No part of this publication may be reproduced, stored in retrieval systems, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission of the publisher.